

N00213.AR.000369  
NAS KEY WEST  
5090.3a

SITE ASSESSMENT REPORT FOR BUILDING A902 TRUCK FILL STAND NAS KEY WEST  
FL  
4/16/1999  
TETRA TECH NUS

**Site Assessment Report**  
for  
**Building A902**  
**Truck Fill Stand**

at

**Naval Air Station**  
Key West, Florida



**Southern Division**  
**Naval Facilities Engineering Command**

**Contract Number N62467-94-D-0888**

**Contract Task Order 0031**

**April 1999**



**SITE ASSESSMENT REPORT  
for  
BUILDING A902  
TRUCK FILL STAND**

**BOCA CHICA FIELD, NAVAL AIR STATION  
KEY WEST, FLORIDA**

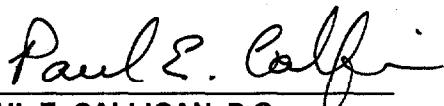
**Submitted to:  
Southern Division  
Naval Facilities Engineering Command  
2155 Eagle Drive  
North Charleston, South Carolina 29406**

**Submitted by:  
Tetra Tech NUS, Inc.  
661 Andersen Drive  
Foster Plaza 7  
Pittsburgh, Pennsylvania 15220**

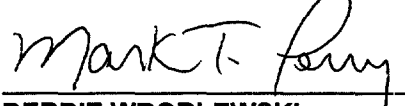
**CONTRACT NUMBER N62467-94-D-0888  
CONTRACT TASK ORDER 0031**

**APRIL 1999**

**PREPARED UNDER THE SUPERVISION OF:**

  
**PAUL E. CALLIGAN, P.G.  
TASK ORDER MANAGER  
FLORIDA LICENSE No. PG-0001864  
TETRA TECH NUS, INC.  
TALLAHASSEE, FLORIDA**

**APPROVED FOR SUBMITTAL BY:**

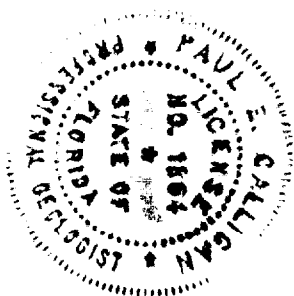
  
**DEBBIE WROBLEWSKI  
PROGRAM MANAGER  
TETRA TECH NUS, INC.  
PITTSBURGH, PENNSYLVANIA**

*for*

## PROFESSIONAL CERTIFICATION

Site Assessment Report  
Truck Fill Stand, Building A902  
Naval Air Station, Key West, Florida

This Site Assessment Report was prepared under the direct supervision of the undersigned geologist using geologic and hydrogeologic principles standard to the profession at the time the report was prepared. If conditions are determined to exist that differ from those described, the undersigned geologist should be notified to evaluate the effects of additional information on the assessment described in this report. This report was developed specifically for the referenced site and should not be construed to apply to any other site.



*Paul E. Calligan*

Paul E. Calligan, P.E.  
Florida License No. PG-0001864

4/23/99  
Date

## EXECUTIVE SUMMARY

Tetra Tech NUS (TtNUS) has completed a Site Assessment (SA) for Building A902 Truck Fill Stand at the Naval Air Station, Key West, Florida. The SA was conducted in accordance with the requirements of Chapter 62-770, Florida Administrative Code (F.A.C.). The assessment report was submitted to the Florida Department of Environmental Protection (FDEP) for approval.

TtNUS performed the following tasks during the SA:

- Reviewed available Navy documents and identified potential sources and receptors for petroleum hydrocarbons in the vicinity, evaluated private potable wells within a 0.25-mile radius and public water supply wells within a 0.50-mile radius, located nearby surface water bodies, and determined surface hydrology and drainage.
- Reviewed previously prepared Closure Report for Tank A902 to determine appropriate boring locations and monitoring well placements.
- Conducted site survey to identify utilities and constructed a site plan.
- Performed direct push investigation which included the installation of 40 soil borings to collect soil and groundwater samples for field screening for BTEX and total petroleum hydrocarbons - diesel range organics (TPH-DRO) using a mobile laboratory.
- Collected three soil samples from selected soil borings for laboratory analysis of the Kerosene Analytical Group parameters.
- Collected one sediment sample from the wetland located northwest of the site for laboratory analysis of the Kerosene Analytical Group parameters.
- Installed three piezometers to approximately 12 feet bls.
- Installed seven shallow monitoring wells to approximately 12 feet below land surface (bls) and one vertical extent monitoring well to approximately 35 feet bls.
- Collected groundwater samples from each site monitoring well for laboratory analysis of the Kerosene Analytical Group parameters.
- Surveyed monitoring well top of casing elevations and collected depth to groundwater measurements.
- Evaluated groundwater flow direction and gradient.
- Performed specific capacity testing on three monitoring wells to evaluate the hydraulic conductivity of the surficial aquifer.

A wetland is located immediately downgradient of the source area. Based on the proximity to the wetland, Rule 62-770.680 specifies that the surface water cleanup criteria also applies to the groundwater at this

site. In addition, the surficial aquifer at the site is classified as a G-III aquifer due to the high total dissolved solids content. Therefore, the GCTLs used for this site are the lower of Tables VII (surface water criteria) and VIII (groundwater of low yield/poor quality) from Chapter 62-770, F.A.C.

Laboratory analytical results from groundwater samples indicate that TPH, PAH and lead concentrations exceed Groundwater Cleanup Target Levels (GCTLs). In addition, field screening data and laboratory analytical results from soil samples indicate that hydrocarbon concentrations in the soil exceed the Soil Cleanup Target Levels (SCTLs) established in Chapter 62-770, F.A.C. (Table IV, I#). "Excessively contaminated" soil, as defined by Chapter 62-770.200 F.A.C., is present at the site. The "excessively contaminated soil" extends from near the surface to the water table at an average depth of approximately 3 feet bls in the vicinity of the former UST location to the west of the dispenser island, as well as a smaller area to the east of the dispenser island.

The upgradient and lateral extent of the dissolved hydrocarbon plume has been defined by the placement of on-site monitoring wells (with the exception of low lead levels in the upgradient well). In addition, the vertical extent of the dissolved hydrocarbon plume has been defined. The downgradient extent of the dissolved hydrocarbon plume has not been defined due to the proximity to the wetland.

Tetra Tech NUS recommends that a source removal be initiated to remediate the contaminated soil at the site. Subsequent to source removal, a supplemental assessment should be conducted to evaluate the impact of the source removal on the dissolved hydrocarbon concentrations.

## TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
<b>EXECUTIVE SUMMARY .....</b>	<b>ES-1</b>
<b>1.0 INTRODUCTION .....</b>	<b>1-1</b>
1.1    PURPOSE AND SCOPE .....	1-1
1.2    SITE DESCRIPTION AND SETTING .....	1-2
1.2.1    Location.....	1-2
1.2.2    Site Description.....	1-2
1.2.3    Topography and Drainage .....	1-2
1.2.4    Geology and Hydrology .....	1-6
1.2.5    Land Use.....	1-6
1.2.6    Potable Water Well Survey .....	1-7
1.3    SITE BACKGROUND .....	1-7
1.3.1    Site History and Operations .....	1-7
1.3.2    Structural Integrity of Tanks and Lines .....	1-8
1.3.3    Closure Assessment.....	1-8
1.3.4    Initial Remedial Action.....	1-8
1.3.4.1    Soil Removal.....	1-8
1.3.4.2    Monitoring Well Overdevelopment.....	1-9
<b>2.0 SUBSURFACE INVESTIGATION METHODS.....</b>	<b>2-1</b>
2.1    QUALITY ASSURANCE .....	2-1
2.2    SOIL BORINGS INSTALLATION.....	2-1
2.2.1    Direct-Push Soil Borings .....	2-1
2.2.2    HSA Soil Borings.....	2-2
2.3    MONITORING WELL AND PIEZOMETER CONSTRUCTION.....	2-2
2.3.1    Piezometer Construction.....	2-2
2.3.2    Monitoring Well Construction .....	2-4
2.4    MEDIA SAMPLING METHODOLOGY.....	2-5
2.4.1    Lithologic Sampling .....	2-5
2.4.2    Soil Vapor Screening .....	2-5
2.4.3    Soil Mobile Lab Screening .....	2-6

## TABLE OF CONTENTS (Continued)

<b><u>SECTION</u></b>	<b><u>PAGE</u></b>
2.4.4 Soil and Sediment Analytical Sampling.....	2-6
2.4.5 Groundwater Mobile Lab Screening .....	2-7
2.4.6 Groundwater Analytical Sampling .....	2-7
2.4.7 Free Product Sampling .....	2-8
2.4.8 IDW Sampling .....	2-8
2.5 HYDROLOGIC INVESTIGATION .....	2-8
2.5.1 Water Level Measurements .....	2-8
2.5.2 Aquifer Characteristics .....	2-9
2.5.3 Groundwater Flow Velocity and Transmissivity .....	2-10
2.5.4 Tidal Influence Survey .....	2-11
 <b>3.0 RESULTS OF INVESTIGATION .....</b>	 <b>3-1</b>
3.1 SITE-SPECIFIC HYDROGEOLOGY .....	3-1
3.1.1 Lithology .....	3-1
3.1.2 Aquifer Characteristics and Classification.....	3-1
3.1.3. Tidal Influence.....	3-4
3.2 SOIL AND SEDIMENT QUALITY .....	3-4
3.3 WATER QUALITY .....	3-9
 <b>4.0 DISCUSSION.....</b>	 <b>4-1</b>
 <b>5.0 CONCLUSIONS AND RECOMMENDATION .....</b>	 <b>5-1</b>
 <b>6.0 REFERENCES .....</b>	 <b>6-1</b>

## TABLE OF CONTENTS (Continued)

<u>SECTION</u>	<u>PAGE</u>
<b>APPENDICES</b>	
A CAR SUMMARY SHEET.....	A-1
B TANK CLOSURE REPORT .....	B-1
C IDW MANIFESTS .....	C-1
D SOIL BORING LOGS.....	D-1
E WELL COMPLETION LOGS .....	E-1
F MOBILE LABORATORY SCREENING RESULTS .....	F-1
G LABORATORY ANALYTICAL REPORTS FOR SOIL .....	G-1
H LABORATORY ANALYTICAL REPORTS FOR GROUNDWATER .....	H-1
I GROUNDWATER SAMPLE LOG SHEETS.....	I-1
J ANALYTICAL REPORTS FOR SOIL PRE-DISPOSAL CHARACTERIZATION .....	J-1
K SPECIFIC CAPACITY TEST DATA AND HYDRAULIC CONDUCTIVITY CALCULATIONS.....	K-1
L GROUNDWATER GRADIENT AND FLOW CALCULATIONS .....	L-1
M TIDAL SURVEY DATA.....	M-1

## TABLES

<u>NUMBER</u>	<u>PAGE</u>
2-1 WELL CONSTRUCTION DETAILS.....	2-3
3-1 GROUNDWATER ELEVATION SUMMARY .....	3-2
3-2 SOIL SCREENING SUMMARY .....	3-5
3-3 SOIL AND SEDIMENT ANALYTICAL SUMMARY .....	3-8
3-4 GROUNDWATER MONITORING WELL ANALYTICAL SUMMARY.....	3-13

## FIGURES

<u>NUMBER</u>	<u>PAGE</u>
1-1 FACILITY LOCATION MAP .....	1-3
1-2 TOPOGRAPHIC MAP .....	1-4
1-3 SITE PLAN .....	1-5
3-1 GROUNDWATER ELEVATION CONTOUR MAP .....	3-3
3-2 SOIL HEADSPACE ANALYSIS DATA MAP .....	3-7
3-3 DISSOLVED VOA CONCENTRATIONS .....	3-10
3-4 DISSOLVED PAH CONCENTRATIONS .....	3-11
3-5 DISSOLVED TRPH CONCENTRATIONS .....	3-12



## 1.0 INTRODUCTION

### 1.1 PURPOSE AND SCOPE

A Site Assessment (SA) was conducted by Tetra Tech NUS (TtNUS) for the US Navy (Navy) Southern Division Naval Facilities Engineering Command under Contract Task Order 0031, for the Comprehensive Long-term Environmental Action Navy (CLEAN III), Contract Number N62467-94-D-0888. The SA was conducted at the Truck Fill Stand, Building A902 (the Site) located at the Naval Air Station (NAS) in Key West, Florida. The Florida Department of Environmental Protection (FDEP) Facility Identification Number is 449400050.

The purpose of this SA was to determine the nature and extent of petroleum hydrocarbon impacted soil and groundwater in accordance with the requirements of Chapter 62-770, Florida Administrative Code (F.A.C.). Taking the following actions at the Truck Fill Stand fulfilled this objective:

- Review of all available applicable documents such as closure reports, discharge reports, maintenance records, and construction plans.
- Survey of potential sources in the vicinity of the Truck Fill Stand.
- Survey of potential receptors in the vicinity of the Truck Fill Stand, including public and private water supplies and surface water bodies.
- Completion of a surface and subsurface soil investigation, as well as an initial groundwater screening, using direct push technology (DPT).
- Mobile laboratory screening of soil and groundwater samples for BTEX and total petroleum hydrocarbons - diesel range organics (TPH-DRO) to aid in determining the optimum number and location of permanent monitoring wells.
- Installation of both shallow monitoring wells and a vertical extent monitoring well.
- Collection of soil, sediment and groundwater samples for laboratory analysis for constituents of the Kerosene Analytical Group.
- Determination of groundwater flow direction, hydraulic conductivity, hydraulic gradient, and transmissivity.

A SAR Summary Sheet, as required by Chapter 62-770, F.A.C., is included in Appendix A.

## **1.2 SITE DESCRIPTION AND SETTING**

### **1.2.1 Location**

The Truck Fill Stand is part of the Fuel Farm Fill Station at Boca Chica Air Field (Figure 1-1). Boca Chica Air Field is located on Boca Chica Key and is part of NAS Key West, Florida. NAS Key West is located approximately 150 miles southwest of Miami on the second to last major islands of the Florida Keys. The Overseas Highway, US Highway 1, connects the Florida Keys to the mainland. NAS Key West is in southern Monroe County, Florida. The U.S. Navy manages 6,323 acres of land divided into twenty separate tracts in the lower Florida Keys, concentrated around Key West and Boca Chica Key. Specifically, the Truck Fill Stand is located within Section 29 of Township 67 South, Range 26 East, as shown on United States Geological Survey (USGS) Boca Chica Key, Florida, 7.5 Minute Series Quadrangle (Figure 1-2).

### **1.2.2 Site Description**

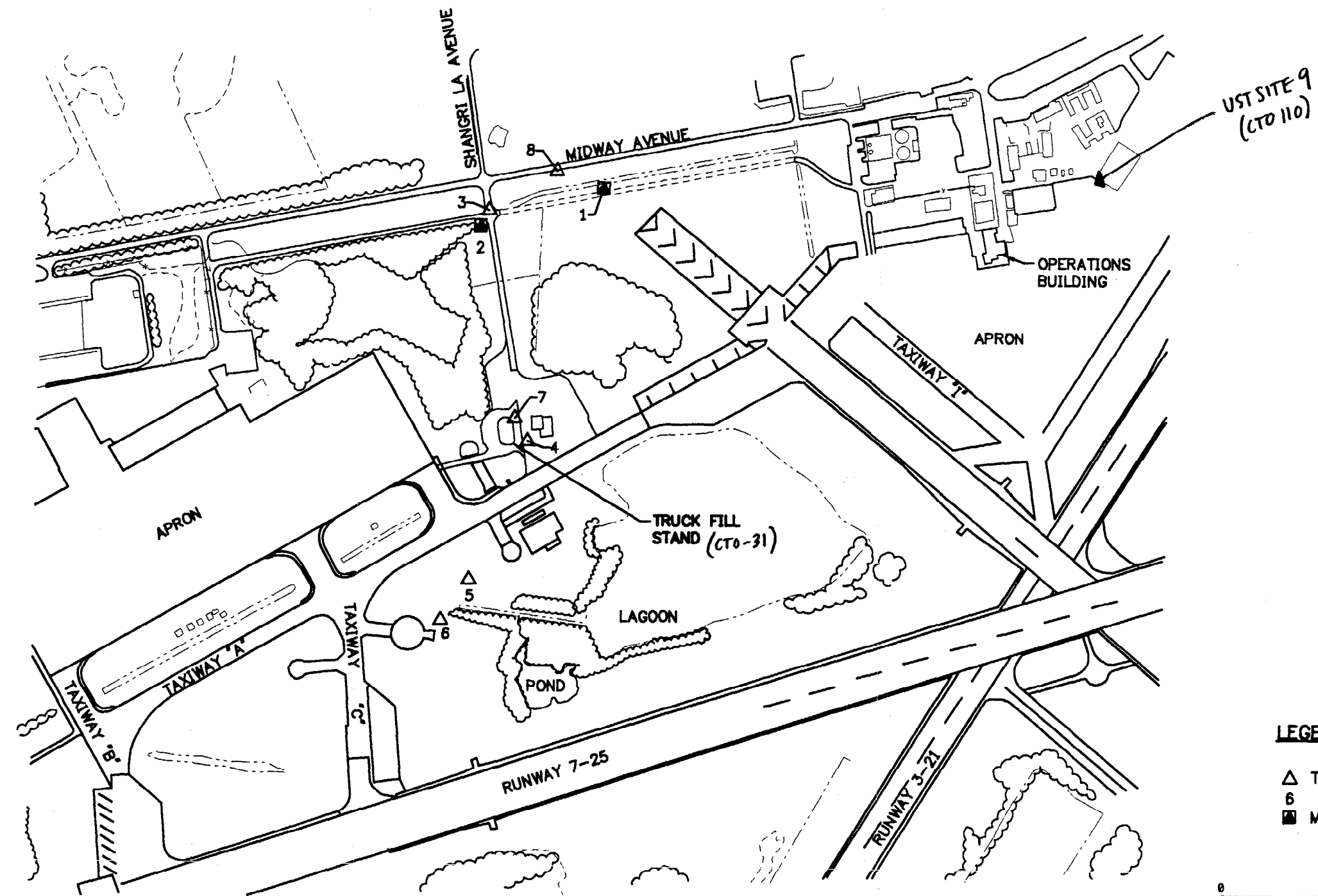
The Truck Fill Stand is an active facility used for filling tanker trucks used to refuel aircraft. Fuel is piped to the Truck Fill Stand from a tank farm located approximately 4000 feet southwest of the site, on the opposite side of the air field. The Truck Fill Stand is the former location of a 1,000-gallon underground storage tank (UST), A902B. UST A902B was installed in 1990 and constructed of plate steel. The UST was used as a water canting storage tank for the jet propellant (JP) 5 fuel filter system at the Truck Fill Stand. Figure 1-3 is a site plan showing the general layout of the site.

### **1.2.3 Topography and Drainage**

The NAS Key West Complex lies in the southeastern Coastal Plain physiographic province. A series of Pliocene marine reefs control the topography of the Coastal Plain in southern Florida (ABB-ES, 1995). The topography of Boca Chica Key and Key West is generally flat. Average land surface elevations are less than 5 feet above mean sea level (msl).


Boca Chica Key is approximately 3 miles wide and 3 miles long. The land surface at the center of the key is generally flat and gently slopes toward the shoreline. Drainage on the key is toward the Atlantic Ocean and Gulf of Mexico, which completely surround the Key. Both of these bodies of water are classified as Class G-III Waters in the vicinity of the Florida Keys. Additionally, the Great White Heron National Wildlife Refuge and the Key West National Wildlife Refuge are

ACAD: O:\7586\7586CM02.DWG 04/20/98 DT



- LEGEND:**
- △ TRAVERSE POINT
  - 6
  - MONUMENT

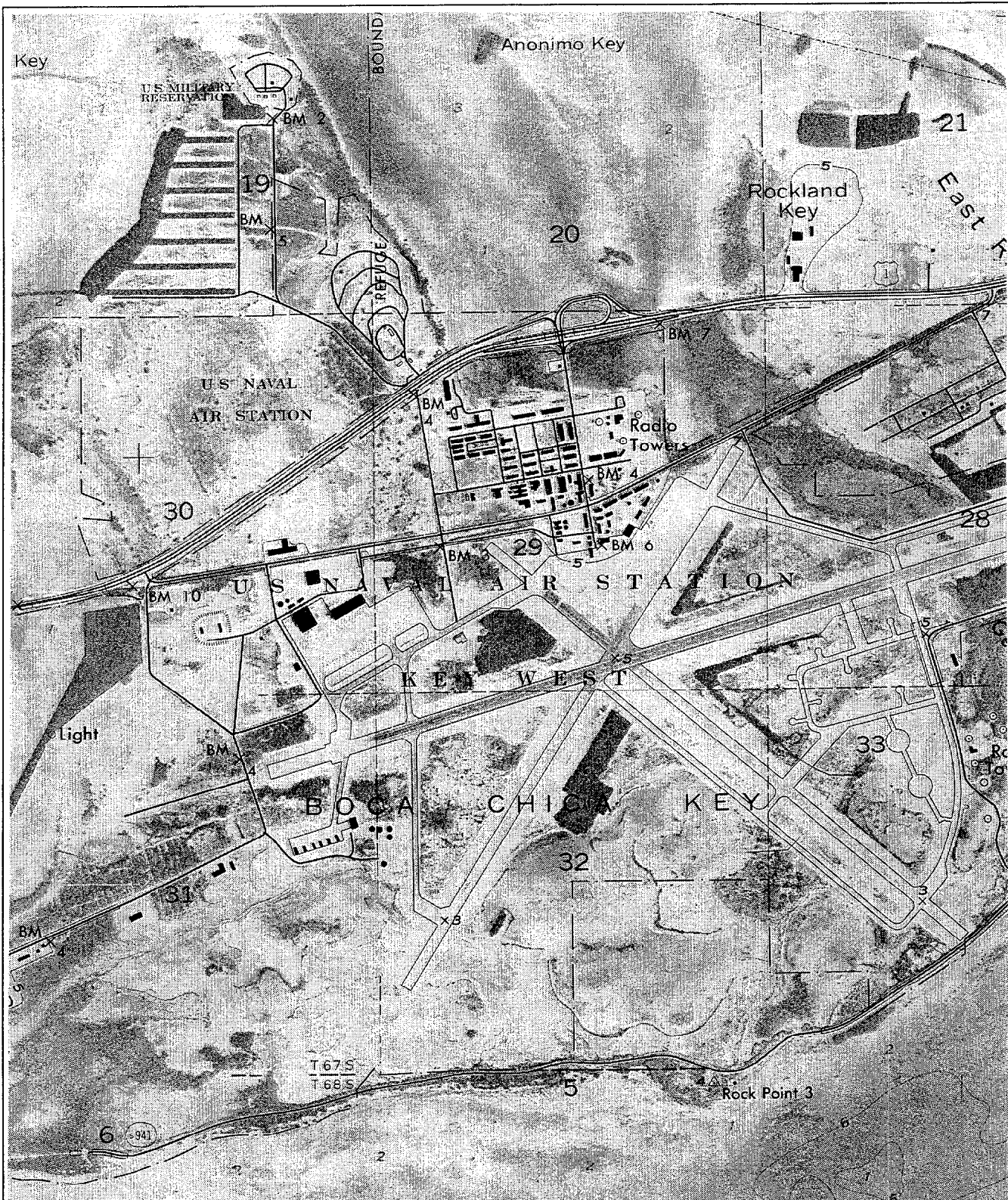


NO.				DATE			REVISIONS			BY	CHKD	APPD	REFERENCES			DRAWN BY	DATE			FACILITY LOCATION MAP TRUCK FILL STAND, BUILDING A902 NAVAL AIR STATION, KEY WEST, FLORIDA		CONTRACT NO. 7586	
																CHECKED BY	DATE					APPROVED BY	DATE
																COST/SCHED-AREA						APPROVED BY	DATE
																SCALE AS NOTED						DRAWING NO. FIGURE 1-1	REV. 0

FORM CADD NO. SDIV\_BH.DWG - REV 0 - 1/28/98

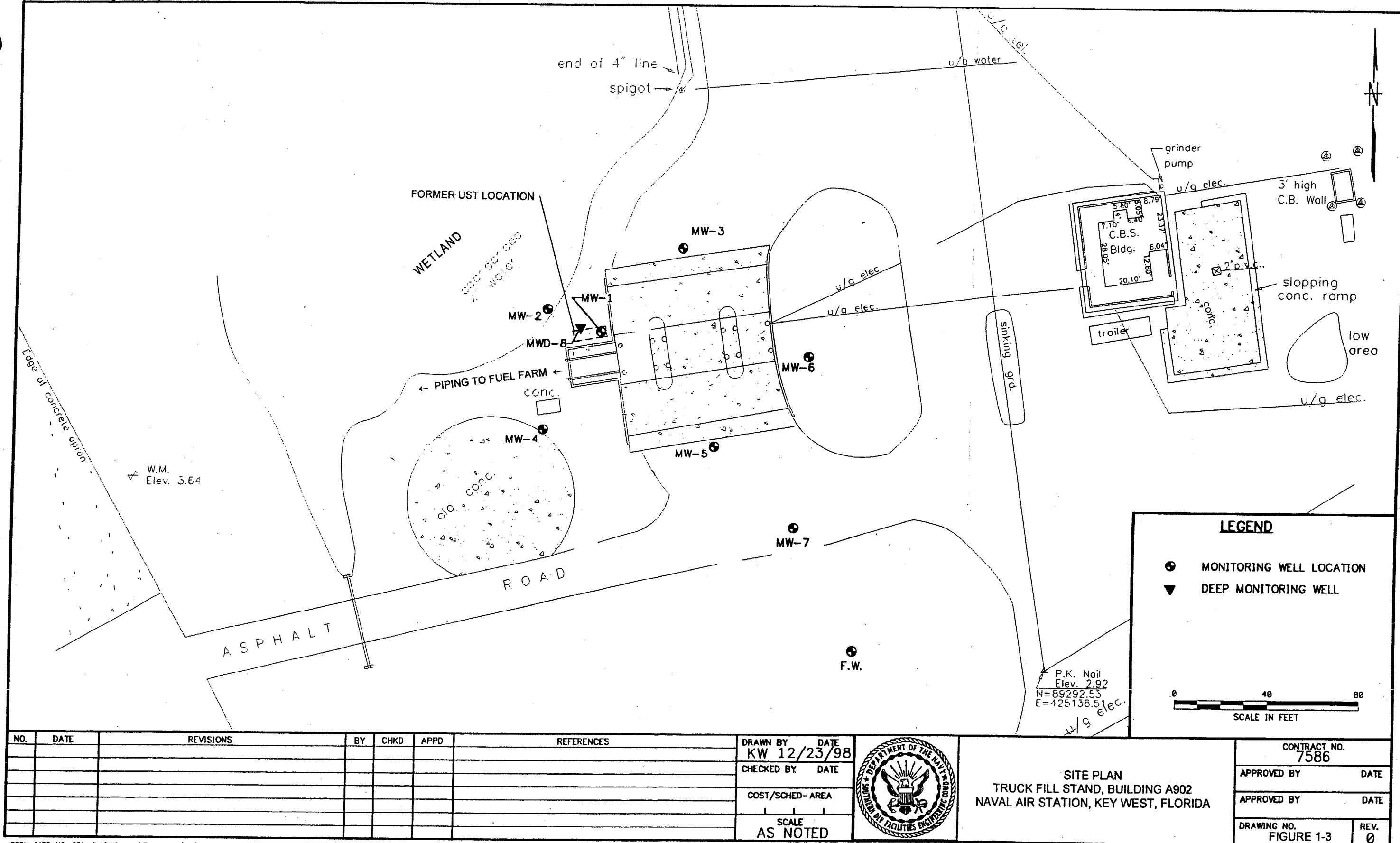
AL240017

ACAD:K:\CADD\BORDERS\SDIV\_AV.dwg 01/21/98 INL



DRAWN BY _____	DATE _____		CONTRACT NO. _____	
CHECKED BY _____	DATE _____		APPROVED BY _____	DATE _____
COST/SCHED-AREA _____			APPROVED BY _____	DATE _____
SCALE 1:24,000			DRAWING NO. FIGURE 1-2	REV. 0

FORM CADD NO. SDIV\_AV.DWG - REV 0 - 1/20/98



located in the immediate vicinity of NAS Key West. These areas are classified as Outstanding Florida Waters and receive the highest degree of protection from the State (BRE, 1997).

The land surface at the truck fill stand area and former UST is covered with concrete and asphalt, which slopes to the northeast and northwest. A wetland is located immediately to the northwest of the site. The perimeter of the wetland appears to be seasonally wet while the central portion of the wetland appears to contain standing water year round. The area to the south of the site is covered with concrete and asphalt taxiways and runways.

#### **1.2.4 Geology and Hydrology**

The lower Keys, which are within the southern geomorphic division of Florida, were formed during the Pliocene era. The Keys are known as the "Oolitic Keys", a reference to the Oolitic Member of the Miami Limestone. The Oolitic Member consists of variably sandy, fossiliferous limestone composed primarily of ooids. The Oolitic Member is divided into two lithofacies: an ooid calcarenite and an oomoldic-recrystalline facies. The Key Largo Limestone underlies the Miami Limestone. The Key Largo Limestone is a light gray to light yellow coralline limestone comprised of coral heads encased in a matrix of calcarenite. In the Key West area, the Miami Limestone is approximately 27 feet thick and the Key Largo limestone is greater than 270 feet thick (BRE, 1997).

The soils on Boca Chica Key are primarily rockland with some filled area and mangrove swamps. Other major soil groups on the Key consist of gravelly sand and calcareous clay, marl, and weathered bedrock (ABB-ES, 1995).

The surficial aquifer system present in the lower Keys is an unconfined, porous, highly permeable solution-riddled unit, as described above. Rainfall recharge seeps quickly into the ocean and saltwater intrusion is common. The water table ranges in depth from less than 1-foot to approximately 2.5 feet below msl and fluctuates diurnally due to tidal effects. The surficial aquifer is non-potable and classified G-III due to its high total dissolved solid content.

#### **1.2.5 Land Use**

Boca Chica Key is almost entirely a military-use area, with the exception of US Highway 1 which crosses the northern portion of the key.

### **1.2.6 Potable Water Well Survey**

No freshwater public or registered domestic wells are in use on NAS Key West (ABB-ES, 1995). Some residences on Boca Chica Key have wells that withdraw water from the surficial aquifer for non-potable uses. Potable water is supplied to all of the Florida Keys. The Florida Keys Aqueduct Authority (FKAA) operates and maintains the Florida Keys Aqueduct, which supplies potable water to all of the Keys. This water is drawn from wells near Florida City in southeastern Dade County. It is pumped 130 miles through a water main that parallels US Highway 1 and terminates in Key West. The Monroe County Health Department recognizes the public water supply as the only potable water source available on Boca Chica Key.

Alternative sources of potable water and non-potable water used in the Keys include private cisterns, private wells utilizing reverse osmosis, home desalination systems, and bottled water. The number of people who may be using water from these alternative sources is unknown. The best estimate of the number of people using local groundwater for non-potable domestic purposes is less than 500 people (IT Corporation, 1993).

Multiple fire control wells have been installed at the facility. Based on information provided by Base personnel, these wells are typically constructed of 12-inch diameter PVC casing extending from the ground surface to a depth of 20-feet. Beneath the casing, an open hole boring extends to a minimum of 50-feet and a maximum of 75-feet below land surface. One of these fire wells is located approximately 150-feet southwest of the site.

## **1.3 SITE BACKGROUND**

### **1.3.1 Site History and Operations**

A U.S. Naval Base was first established on Key West in 1823. The Base was expanded during the Mexican War, the Spanish-American War, and again during World War I. In 1939 a seaplane base was opened and in 1942, the Boca Chica Air Field was constructed. During World War II, Key West Naval Air Station was established as the Sixth Naval District Headquarters. Since that period, the role of the military at NAS has decreased. Currently, NAS Key West maintains aviation operation, a research laboratory, communications intelligence, counter-narcotics air surveillance operations, a weather service and other activities. Boca Chica Air Field encompasses approximately 3,250 acres.

According to Base personnel, the Truck Fill Stand has been in operation since approximately 1945. UST A902B was reportedly installed in 1990. During a preliminary visit to the site, the supervisor of the truck fill stand operation indicated that a tanker-truck had ruptured after a collision with the canopy supports in 1986. Approximately 3,000 gallons of JP-5 were discharged to the ground surface. No record or discharge form recording this event was found during TtNUS' records search.

### **1.3.2 Structural Integrity of Tanks and Lines**

According to Omega Environmental Services (OES), UST A902B was "in excellent condition with no sign of leaks" at the time of removal (OES, 1995). No records of tank and line tightness testing could be located for this tank.

### **1.3.3 Closure Assessment**

In September 1995, OES was contracted to perform a closure assessment on UST A902B. The UST and its associated piping and vents were removed on September 28, 1995. A Closure Assessment Report, Closure Assessment Form, and UST Installation And Removal Form were filed on October 25, 1995. The report noted that both contaminated soil and free phase petroleum product were present in the UST excavation area. In addition, the report stated that the tank appeared in excellent condition with no signs of leaks. The report concluded that the groundwater contamination detected might have come from a different source or from spillage. The NAS Public Works Department submitted a Discharge Notification Form to the FDEP on July 30, 1996. The closure report, closure forms, and discharge notification form are included in Appendix B.

### **1.3.4 Initial Remedial Action**

#### **1.3.4.1 Soil Removal**

In an October 3, 1996 letter to the Florida Department of Health and Rehabilitative Services, the Engineering Director of the NAS Key West Public Works Department reported that approximately 24 cubic yards of contaminated soil were excavated and removed from the former UST location on August 28, 1996. The letter indicated that the excavation area was approximately 12 feet in diameter and extended from the ground surface to the water table. It was noted that the soil was contaminated from the ground surface to the water table. The estimated total volume of contaminated soil removed was 24 cubic yards.



#### **1.3.4.2 Monitoring Well Overdevelopment**

Evaluation of the laboratory analytical data from groundwater samples collected from the monitoring wells installed during this investigation indicated that dissolved hydrocarbon concentrations exceeded regulatory target levels in the upgradient and downgradient wells. The FDEP was contacted in September 1998 to discuss these results. During this discussion, the FDEP recommended that monitoring wells A902-MW01 (source), A902-MW02 (downgradient) and A902-MW07 (upgradient) be overdeveloped in an attempt to lower the contaminant concentrations to within target levels.

On November 17 through 19, 1998, TtNUS personnel visited the site to overdevelop these three wells. Each well was pumped for a period of 72 hours with a submersible pump. TtNUS personnel returned to the site on December 2, 1998 to collect groundwater samples from these three wells. The sampling methodology and laboratory analytical results are discussed in Section 2.4.6 and Section 3.3 respectively.

## **2.0 SUBSURFACE INVESTIGATION METHODS**

### **2.1 QUALITY ASSURANCE**

The site investigation was conducted in accordance with the Standard Operating Procedures prescribed by the FDEP Quality Assurance Section Document DER-001/92, and adopted by the TtNUS Comprehensive Quality Assurance Plan (CQAP) Number 980038.

### **2.2 SOIL BORING INSTALLTION**

Soil borings at the Truck Fill Stand were installed using two advancement methods: direct push technology (DPT) and hollow stem augers (HSA). Prior to breaking ground at any soil boring location, TtNUS reviewed utility drawings provided by the NAS Key West public works department, and requested utility mark-outs from Sunshine One-Call.

All soil boring advancement equipment was decontaminated prior to and following each installation according to TtNUS' CQAP. All rinse water generated during the decontamination of equipment was containerized in 55-gallon drums, sampled, and removed for proper disposal.

In addition to liquid investigative derived waster (IDW), soil cuttings were also generated during soil boring installation. Soil cuttings were also placed in a 55-gallon steel drums, sampled, and removed for proper disposal. Transport manifests and disposal records for all IDW are provided in Appendix C. Soil boring lithologic logs are presented in Appendix D.

#### **2.2.1 Direct-Push Soil Borings**

TtNUS conducted a soil vapor assessment at the Truck Fill Stand on June 23 through June 26, 1998. DPT soil borings were advanced for the dual purpose of collecting soil and groundwater samples. Forty soil borings (A902-SB01 through A902-SB40) were advanced in the area around the former UST system. Soil samples were collected from each boring for the purpose of organic vapor screening, mobile laboratory screening, and for lithologic description. Soil borings were advanced using an EnviroCore, truck mounted, direct-push, hydraulic soil probe. Soil samples were collected continuously using three-foot long stainless steel samplers lined with plastic sleeves. DPT soil borings were typically terminated approximately 3 feet below the surface of the water table. Three of the DPT soil borings were used to install piezometers and were terminated approximately 9 feet below the surface of the water table.

Subsequent to evaluation of the field screening data, three additional DPT soil borings (A902-SB41 through A902-SB43) were advanced to obtain samples for laboratory analysis to confirm the field screening data. These borings were advanced using a GeoProbe, truck mounted, direct-push, hydraulic soil probe.

### **2.2.2 HSA Soil Borings**

On August 25 and 26, 1998, eight soil borings, A902-MW01, A902-MW02, A902-MW03, A902-MW04, A902-MW05, A902-MW06, A902-MW07 and A902-MWD8 were drilled by Precision Drilling using HSA drilling techniques. HSA soil borings were advanced for the installation of groundwater monitoring wells. During the advancement of the deep monitoring well boring (A902-MWD8), soil samples were collected continuously from the surface to the total depth of the boring. The samples were used to characterize the site lithology and/or provide additional assessment data on soil vapor concentrations in the area. These soil samples were collected through the 4.25-inch augers with steel split-spoon samplers. The split-spoon samplers were 2-inch inside diameter (ID) and 2-feet long. They were advanced ahead of the lead auger with a weighted hammer in order to collect a relatively undisturbed soil sample.

## **2.3 MONITORING WELL AND PIEZOMETER CONSTRUCTION**

### **2.3.1 Piezometer Construction**

Piezometers were installed in conjunction with the DPT soil boring procedures discussed above in Section 2.2.1. Piezometers A902-P1, A902-P2 and A902-P3 were installed to obtain water level measurements to determine relative groundwater elevations and flow direction to aid in the placement of permanent monitoring wells. The piezometers were constructed of 0.75-inch ID, flush-threaded, schedule 40 PVC riser from 0 to 2 feet bls with 0.010-inch slotted screen interval from 2 to 12 feet bls. 20/30 silica sand was used as the filter media from 1 to 12 feet bls. A 6-inch layer of bentonite pellets was placed above the sand pack and hydrated. The remainder of the annulus was grouted to within 3-inches of the top of casing with a Type I Portland Cement/Bentonite slurry. The piezometers were secured with a locking water tight cap within an 8-inch diameter steel manhole. Piezometer construction details are summarized on Table 2-1. Well completion logs are provided in Appendix E.

**TABLE 2-1: WELL CONSTRUCTION DETAILS**

Facility Name: Truck Fill Stand, NAS Key West

Facility ID#: 449400050

WELL NO.	DATE INSTALLED	INSTALLATION METHOD	TOP OF CASING ELEVATION	A/G RISER LENGTH, IF APPLICABLE	TOTAL WELL DEPTH (FEET)	SCREENED INTERVAL (FBL)	WELL DIAMETER (IN.)	LITHOLOGY OF SCREENED INTERVAL
A902-P1	26-Jun-98	DPT	3.41	N/A	12.00	2 - 12	0.75	Oolitic Limestone
A902-P2	26-Jun-98	DPT	4.24	N/A	12.00	2 - 12	0.75	Oolitic Limestone
A902-P3	26-Jun-98	DPT	4.07	N/A	12.00	2 - 12	0.75	Oolitic Limestone
A902-MW01	26-Aug-98	HSA	4.41	N/A	11.90	1.90 - 11.90	2	Oolitic Limestone
A902-MW02	26-Aug-98	HSA	2.98	N/A	11.95	1.95 - 11.95	2	Oolitic Limestone
A902-MW03	26-Aug-98	HSA	4.25	N/A	11.50	1.50 - 11.50	2	Oolitic Limestone
A902-MW04	26-Aug-98	HSA	2.63	N/A	11.97	1.97 - 11.97	2	Oolitic Limestone
A902-MW05	26-Aug-98	HSA	4.46	N/A	11.95	1.95 - 11.95	2	Oolitic Limestone
A902-MW06	26-Aug-98	HSA	4.00	N/A	11.94	1.94 - 11.94	2	Oolitic Limestone
A902-MW07	26-Aug-98	HSA	4.22	N/A	11.95	1.95 - 11.95	2	Oolitic Limestone
A902-MWD8	25-Aug-99	HSA	4.11	N/A	35.10	30.10 - 35.10	2	Oolitic Limestone

### 2.3.2 Monitoring Well Construction

Monitoring wells were installed in conjunction with the HSA soil boring procedures discussed in Section 2.2.2. Prior to installation of the monitoring wells, the soil and groundwater screening data obtained during the DPT investigation was evaluated to determine the optimum number and location of the wells. Monitoring wells were designed to ensure that the screened interval was intersected by the surface of the water table. Monitoring well placements were selected to provide spatial coverage around the former UST for groundwater sampling. Results of the sampling were used to evaluate if the groundwater in the area of the former UST system has been impacted by petroleum products.

The monitoring wells were installed using a Diedrich D-120, truck mounted drill rig using 4.25-inch ID hollow stem augers. Each well was constructed of 2-inch ID, flush-threaded, schedule 40 PVC riser and 0.010-inch slot well screen with a 6-inch silt trap and well bottom cap. The shallow wells were installed to approximately 12 feet bls with a 10 foot screen section. The vertical extent well was installed to a depth of 35 feet with a 5 foot screen section. The annulus around each well was filled to approximately 1 foot above the screen with US Standard Sieve size 20/30 silica sand, followed by a 6-inch to 1 foot 30/65 fine sand seal. The remainder of the annulus was grouted to the surface. Each well is secured with a locking, water-tight cap within a steel, 8-inch diameter steel manhole. The manhole is set within a 24-inch square concrete apron finished slightly above grade. Monitoring well construction details are summarized on Table 2-1. Monitoring well completion logs are provided in Appendix E.

Each monitoring well was developed using a centrifugal pump. Field measurements of pH, temperature, and specific conductance were collected from the water generated during development. All monitoring wells were developed until such field measurements became stable and the purge water clear or for a maximum of one hour. Stabilization of field measurements is based on the USEPA SOP (1997) which specifies the following criteria: temperature  $\pm 0.5^{\circ}\text{C}$ , pH  $\pm 0.1$  unit, and specific conductance  $\pm 10$   $\mu\text{mhos/cm}$ . A TtNUS geologist supervised all monitoring well development. All development water was containerized as liquid IDW for later sampling and disposal.

## **2.4 MEDIA SAMPLING METHODOLOGY**

### **2.4.1 Lithologic Sampling**

Representative soil samples were collected during the subsurface investigation in order to assess the shallow subsurface geologic conditions at the Truck Fill Stand. Soil boring logs are provided in Appendix D.

### **2.4.2 Soil Vapor Screening**

During DPT soil boring installation, a soil vapor assessment was conducted. The assessment consisted of both visual inspection for petroleum staining and soil vapor screening with an organic vapor analyzer (OVA) equipped with a flame ionization detector (FID). The soil vapor analysis was performed according to the headspace method prescribed in Rule 62-770.200(8) F.A.C. Using this method, two 16 ounce glass soil jars were half-filled with soil sample (duplicate samples). The soil jars were then sealed with aluminum foil. The soil samples were allowed to equilibrate to ambient temperature which was within the FDEP temperature range.

The samples were screened with a Heath Porta FID II organic vapor analyzer (OVA) equipped with a flame ionization detector (FID). Prior to each days activities, the OVA was field calibrated with 100 ppm methane in air, in accordance with the manufacturers specifications. Sample screening was performed by inserting the OVA probe through the foil sample cover and recording the highest OVA reading. Following collection of this OVA reading, the OVA was fitted with a granular activated carbon filter probe. The OVA was then used to test the headspace above the duplicate sample. Carbon absorbs petroleum hydrocarbons and thus the filtered reading is assumed to represent naturally occurring organic vapors.

Upon completion of the screening exercise, the carbon filtered result was subtracted from the un-filtered result, to obtain a net petroleum vapor value. In accordance with Rule 62-770.200(8), F.A.C., corrected headspace levels in excess of 50 ppm is defined as "excessively contaminated soil" for the Kerosene Analytical Group. Corrected headspace levels in excess of 10 ppm but less than 50 ppm are considered as contaminated, though not excessively contaminated.

### **2.4.3 Soil Mobile Lab Screening**

During the DPT soil vapor assessment, one soil sample was collected from each soil boring for field screening by a mobile laboratory. Each sample was collected from the sample interval within the vadose zone which exhibited the highest OVA-FID reading. These samples were placed in 4-ounce glass jars and immediately given to the onsite mobile laboratory for screening for BTEX, by USEPA Modified Method 8260B and TPH-DRO, by USEPA Modified Method SW-846 8015. The mobile laboratory was provided by KB Labs, Inc. Mobile lab screening results are provided in Appendix F.

### **2.4.4 Soil and Sediment Analytical Sampling**

Soil samples for laboratory analysis were collected from soil borings A902-SB41, A902-SB42, and A902-SB43 as described in Section 2.2.3 above. In accordance with Rule 62-770.600(3)(e), the boring locations and sample intervals were selected to coincide with samples that exhibited high, medium and low field screening results during the soil vapor survey. A902-SB41 was installed immediately adjacent to A902-SB18 (low OVA). A902-SB42 was installed immediately adjacent to A902-SB09 (medium OVA). A902-SB43 was installed immediately adjacent to A902-SB07 (high OVA). The soil samples were placed in the appropriate jars (provided by the laboratory), packed on ice, and shipped via overnight courier to PC&B Environmental Laboratories in Oviedo, Florida. The soil samples were then analyzed for USEPA method 8021 for volatile organic aromatics, USEPA method 8100 for polynuclear aromatic hydrocarbons, USEPA method 415.1 for total organic carbon (TOC), and the Florida PRO method for total recoverable petroleum hydrocarbons (TRPH). This sampling data was collected in order to confirm the presence of petroleum-related compounds indicated during the screening assessment.

A sediment sample was collected from the wetland located northwest of the site. The sample was collected for laboratory analysis to ascertain if the wetland had been impacted by petroleum products. The sample location was approximately 25 feet northwest (downgradient) of monitoring well A902-MW02. The sample was collected using a pre-cleaned stainless steel bowl and trowel. The sediment sample was placed in the appropriate jars (provided by the laboratory), packed on ice, and shipped via overnight courier to PC&B Environmental Laboratories in Oviedo, Florida. The sample was analyzed for USEPA method 8021 for volatile organic aromatics, USEPA method 8100 for polynuclear aromatic hydrocarbons, and the Florida PRO method for total recoverable petroleum hydrocarbons (TRPH). The laboratory analytical reports for the soil and sediment samples are provided in Appendix G.

#### **2.4.5 Groundwater Mobile Lab Screening**

During the DPT portion of the field investigation, each soil boring was continued into the saturated zone in order to collect groundwater samples for mobile laboratory screening. The groundwater samples were collected using a detachable drive tip attached to a 24-inch long, retractable, stainless steel well screen encased in the lead probe tube. After this groundwater sampler was advanced into the water bearing zone, the probe tube was withdrawn 24 inches to allow the retractable screen open contact with the formation. A length of PE tubing was then inserted into the probe and connected to a peristaltic pump. Several screen volumes were removed from the probe in order to reduce turbidity levels. After sufficient purging, groundwater samples were collected by pumping directly into 40 milliliter (mL) vials. These samples were immediately taken to the on-site mobile laboratory and screened for BTEX and TPH-DRO constituents using the methods described in Section 2.4.3. All purge water was placed in 55-gallon drums on-site for later sampling and disposal. The mobile laboratory screening results are presented in Appendix F.

#### **2.4.6 Groundwater Analytical Sampling**

Groundwater samples were collected from site monitoring wells to determine if the groundwater in the vicinity of the former UST has been impacted by petroleum products. TtNUS personnel collected groundwater samples from all site monitoring wells on August 28 through August 30, 1998. Additional samples were collected from monitoring wells A902-MW01, A902-MW02 and A902-MW07 on December 2, 1998. These samples were collected to evaluate the effectiveness of overdeveloping that was performed in November, 1998 (see Section 1.3.4.2). Groundwater samples collected from each monitoring well were analyzed using USEPA Method 8021 for volatile organic aromatics and volatile organic halocarbons, USEPA Method 504.1 for 1,2-dibromoethane (EDB), USEPA Method 8310 for PAHs, USEPA Method 6010 for lead (unfiltered), and Florida PRO for TRPH. The groundwater samples were collected using the low-flow quiescent purging and sampling method using new Teflon tubing and a peristaltic pump. Approximately five well volumes of groundwater were removed from each well using the peristaltic pump and Teflon tubing. Temperature, pH, specific conductance, turbidity measurements, and well purge volumes were recorded at the time of sample collection. Groundwater samples were placed on ice and shipped to PC&B Environmental Laboratories in Oviedo, Florida. The laboratory analytical reports for the groundwater samples are included in Appendix H. Groundwater sample log sheets are provided in Appendix I.



All sampling activities were performed in accordance with the procedures prescribed in the FDEP Quality Assurance Section's Standard Operating Procedures for Laboratory Operations and Sample Collection Activities, (DER-001/92), adopted by TtNUS' CQAP. Sample preservation was accomplished by obtaining pre-preserved containers from a laboratory with an approved CQAP (PC&B). During the groundwater sampling event, quality control samples (e.g. equipment blanks and trip blanks) were prepared and submitted to the laboratory as required by the approved CQAP. Sampling activities were documented in a site-specific field logbook, and samples were transmitted under chain-of-custody protocols to the laboratory.

#### **2.4.7 Free Product Sampling**

Prior to groundwater sampling, TtNUS personnel checked each well for free product using an ORS oil/water interface probe. No free product was encountered during this investigation.

#### **2.4.8 IDW Sampling**

Upon completion of the monitoring well installation program, TtNUS personnel collected a composite soil sample from the IDW drums generated during DPT and monitoring well installation activities. The sample was collected for laboratory analysis for pre-disposal characterization. The soil sample was placed in the appropriate jars (provided by the laboratory), packed on ice, and shipped via overnight courier to PC&B Environmental Laboratories in Oviedo, Florida. The soil sample was then analyzed for USEPA method 8021 for volatile organic aromatics, USEPA method 8100 for polynuclear aromatic hydrocarbons, USEPA method 5050/9252 for total halogens, and the Florida PRO method for TRPH. Laboratory analytical reports for the IDW samples are included in Appendix J.

### **2.5 HYDROLOGIC INVESTIGATION**

#### **2.5.1 Water Level Measurements**

The depths to groundwater in all site monitoring wells were collected on October 2, 1998. Measurements were collected from the north rim of the top of well casings using an electronic water level indicator. The water level measurements were collected to determine the depth to water in the surficial aquifer.

The elevation of the north rim for each top of well casing was surveyed by Frederick H. Hildebrandt, a Florida registered surveyor, to the nearest 0.01 foot relative. Elevations are based on the N.G.V.D. 1929 Datum and benchmark number K-271 (elevation 3.317 feet msl).

Groundwater elevations were determined by subtracting the measured depth to groundwater for each well from its respective top of casing elevation.

### **2.5.2 Aquifer Characteristics**

On August 30, 1998, TtNUS personnel performed specific capacity tests on monitoring wells A902-MW03, A902-MW05 and A902-MW06. The objective of the specific capacity tests was to determine the productivity or the yield per unit of drawdown of the aquifer in which the wells are screened. In addition, the specific capacity tests were conducted to provide a quantitative estimate of the hydraulic conductivity of the shallow aquifer.

Specific capacity is defined as yield divided by drawdown, and is normally expressed as gallons per minute/feet of drawdown. Both the pumping rate and drawdown were measured simultaneously in the tested wells after the water level stabilized and a given amount of time elapsed. Dividing the yield rate by the stabilized drawdown, when both are measured simultaneously, gives the specific capacity. Specific capacity can vary with pumping duration, with specific capacity decreasing as pumping time increases. Additionally, specific capacity generally decreases as discharge rate increases. Both of these responses are due to the dewatering of the aquifer within the domain of the cone of depression; for a given amount of drawdown, the yield progressively becomes less as the saturated thickness of the aquifer is reduced. Specific capacity may also vary with yield as function of the system efficiency, including the pump, well, discharge piping, well efficiency, etc., which all add an element of friction to the process.

A submersible pump was used to conduct the specific capacity tests. Measurement of the flow rate was determined using a graduated bucket and stopwatch. The drawdown in the well was measured with an electrical water level indicator. The water-level was also measured using a data logger and pressure transducer. Upon completion of the specific capacity test, the pump was shut off and the rise in water level or the residual drawdown was measured.

Aquifer parameters of hydraulic conductivity and transmissivity were calculated from the specific capacity test data using a computer program developed by Kasenow and Pare (1995) based on

equations presented in Theis (1935), Lohman (1972) and Turcan (1962). Drawdown data from the well, as recorded by the data logger, was entered into the computer program along with required variables that characterize the aquifer (storage and well-loss coefficients), the pumping rate, and well dimensions. Based upon this information the program estimated specific capacity, transmissivity, and hydraulic conductivity. Data output sheets from the Kasenow program are provided in Appendix K.

### **2.5.3 Groundwater Flow Velocity**

The horizontal groundwater gradient across the site was evaluated from water level measurements collected on October 2, 1998. The groundwater gradient was calculated by determining the perpendicular distance between groundwater contours developed from groundwater elevation data. Groundwater gradient calculations are included in Appendix L.

The groundwater flow gradient was determined using the following equation:

$$i = \frac{h_1 - h_2}{d}$$

where:

- i = the hydraulic gradient
- $h_1$  = the water elevation at point 1
- $h_2$  = the water elevation at point 2
- d = the distance between point 1 and point 2

Potential movement of groundwater at the site may be described in terms of transportation by natural flow in the saturated zone while assuming groundwater flow follows Darcy's Law. Darcy's Law may be expressed as:

$$V = \left( \frac{K}{n} \right) \times i$$

where:

- V = average seepage velocity
- K = hydraulic conductivity
- n = effective porosity (assumed)
- i = average hydraulic gradient

The groundwater seepage velocity calculations are included in Appendix L.

#### **2.5.4 Tidal Influence Survey**

A tidal survey was conducted during the SA to determine if the potentiometric surface at the site is influenced by tidal fluctuations. Continuous water level measurements were obtained from monitoring well A902-MW06 for a period of 24 hours. The measurements were obtained using a Hermit data logger. The output file from the data logger is provided in Appendix M.

## 3.0 RESULTS OF INVESTIGATION

### 3.1 SITE-SPECIFIC HYDROGEOLOGY

#### 3.1.1 Lithology

The site is underlain by sediments composed predominately of light brown to beige to white, sandy, oolitic limestone with some shell fragments. The material ranges from moderately consolidated to hard and is moderately to highly weathered with intergranular and moldic porosity. This lithology extends to at least 35 feet bls, which was the maximum depth drilled during the investigation. Due to the homogeneity of the subsurface, no lithologic cross-section was constructed. Soil boring logs are included as Appendix D.

#### 3.1.2 Aquifer Characteristics and Classification

Based on water level data collected from site monitoring wells on October 2, 1998, the depth to the shallow aquifer across the study area is approximately 1 to 3 feet bls. The groundwater level measurements are presented in Table 3-1. As discussed in Section 1.2.4, the surficial aquifer at Boca Chica Key is classified as a non-potable, G-III aquifer.

Specific capacity tests conducted at monitoring wells A902-MW03, A902-MW05 and A902-MW06 were used to estimate the hydraulic conductivity of the surficial aquifer at the Truck Fill Stand. The geometric mean hydraulic conductivity for the surficial aquifer was estimated 4.34 ft/day as shown by the hydraulic conductivity calculations provided in Appendix K.

Using the groundwater flow gradient equation presented in Section 2.5.3, a hydraulic gradient of 0.001 feet/foot to the south-southeast was calculated from the data collected on October 2, 1998. The groundwater flow direction is depicted in Figure 3-1.

Lithologic data and available literature indicate the effective porosity of the lithology comprising the surficial aquifer is approximately 0.30 (Heath, 1994).

Using a hydraulic conductivity of 4.34 feet/day, the hydraulic gradient of 0.001 feet/foot, an inferred effective porosity value of 0.30, and Darcy's Equation as stated in Section 2.5.3, the groundwater seepage velocity across the site was calculated at 0.02 feet/day in a northwest

**TABLE 3-1: GROUNDWATER ELEVATION SUMMARY****Facility Name: Truck Fill Stand, NAS Key West****Facility ID#: 449400050****All Measurements = Feet (except as noted)****No Data = Blank****ND = Not Detected**

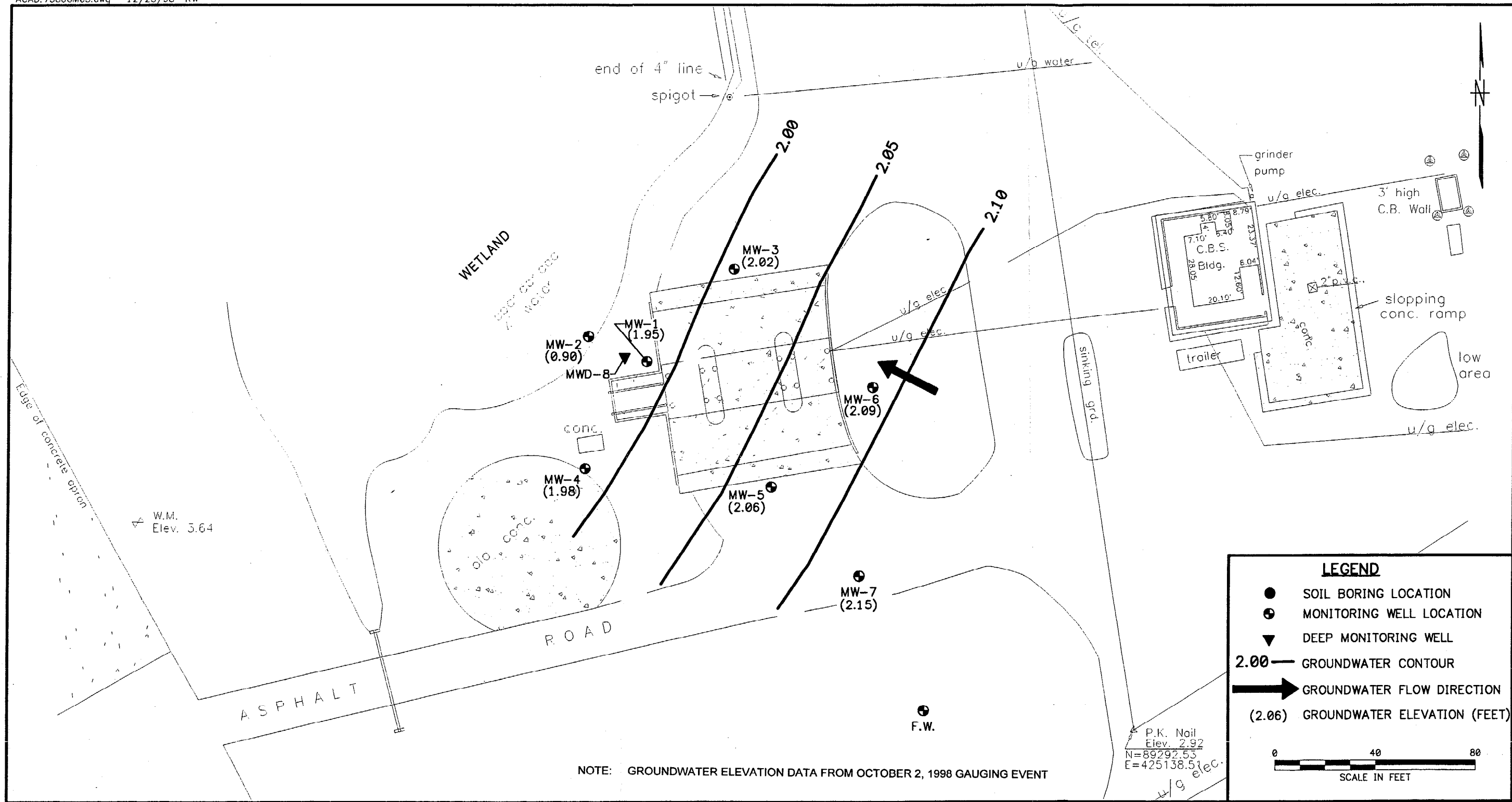
WELL NO.	A902-MW01	A902-MW02	A902-MW03	A902-MW04	A902-MW05	A902-MW06
DIAMETER	2"	2"	2"	2"	2"	2"
WELL DEPTH	11.90	11.95	11.50	11.97	11.95	11.94
SCREEN INTERVAL	10	10	10	10	10	10
TOC ELEVATION	4.41	2.98	4.25	2.63	4.46	4.00


DATE	ELEV	DTW	FP	ELEV	DTW	FP	ELEV	DTW	FP	ELEV	DTW	FP	ELEV	DTW	FP	ELEV	DTW	FP
02-Oct-98	1.95	2.46	ND	0.90	2.08	ND	2.02	2.23	ND	1.98	0.65	ND	2.06	2.40	ND	2.09	1.91	ND
02-Dec-98	1.00	3.41	ND	0.96	2.02	ND	1.11	3.14	ND	1.08	1.55	ND	1.11	3.35	ND	0.97	3.03	ND

WELL NO.	A902-MW07	A902-MWD8				
DIAMETER	2"	2"				
WELL DEPTH	11.95	35.10				
SCREEN INTERVAL	10	5				
TOC ELEVATION	4.22	4.11				

DATE	ELEV	DTW	FP	ELEV	DTW	FP	ELEV	DTW	FP	ELEV	DTW	FP	ELEV	DTW	FP	ELEV	DTW	FP
02-Oct-98	2.15	2.07	ND	1.13	2.98	ND	0.00			0.00			0.00			0.00		
02-Dec-98	1.17	3.05	ND	0.77	3.34	ND	0.00			0.00			0.00			0.00		

ACAD:7586GM03.dwg 12/23/98 KW



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES	DRAWN BY	DATE		CONTRACT NO. 7586	
							KW	12/23/98		APPROVED BY	DATE
							CHECKED BY	DATE		APPROVED BY	DATE
							COST/SCHED-AREA			DRAWING NO. FIGURE 3-1	REV. 0
							SCALE AS NOTED	GROUNDWATER ELEVATION CONTOUR MAP TRUCK FILL STAND, BUILDING A902 NAVAL AIR STATION, KEY WEST, FLORIDIA			

FORM CADD NO. SDIV\_BH.DWG - REV 0 - 1/20/98

0134 6032

direction. The transmissivity of the surficial aquifer was calculated from specific capacity test data using a computer program by Kasenow and Pare (1995). Based on output obtained from this program, the transmissivity at the site ranges from 140.6 ft<sup>2</sup>/day (1049 gpd/ft) in A902-MW03 to 200.9 ft<sup>2</sup>/day (1499 gpd/ft) in A902-MW05. These values are consistent with published values for transmissivity for the surficial aquifer in this area.

### **3.1.3 Tidal Influence**

The data collected during the tidal survey conducted on monitoring well A902-MW06 reveal a 0.15 foot fluctuation in water level over a 24 hour period. This data suggests that there is a minimal tidal influence on the surficial aquifer at the site. The data from the tidal survey is provided in Appendix M.

## **3.2 SOIL AND SEDIMENT QUALITY**

The vertical and horizontal extent of petroleum impacted soil in the vadose zone was assessed through soil vapor analysis performed during the direct-push investigation and monitoring well installation as described in Section 2.2.1 and 2.2.2 of this report. Soils exhibiting an OVA response of greater than 50 ppm were encountered in numerous borings across the site. These data indicate that "excessively contaminated" soil (greater than 50 ppm OVA response as defined by Chapter 62-770.200, F.A.C.) is present at the site. The "excessively contaminated soil" extends from near the surface to the water table at a depth of approximately 3 feet in the vicinity of the former UST location to the west of the dispenser island, as well as a smaller area to the east of the dispenser island. The mobile laboratory results indicate a distribution of contaminants that is similar to the OVA results. Soil vapor screening results are presented in Table 3-2. Soil boring locations and vapor readings are depicted on Figure 3-2.

The results of the laboratory analysis of soil samples confirm that petroleum related compounds are present in the vadose zone soil at the site. The highest concentration of petroleum constituents was detected in the soil sample collected from A902-SB42. TPH and PAH concentrations in this sample exceed the soil cleanup target levels (SCTLs) established by Chapter 62-770, F.A.C. Laboratory analytical results for soil samples are summarized on Table 3-3.

Laboratory analytical results from the sediment sample collected from the wetland indicate that low levels of petroleum related compounds are present in the sediment. The TRPH level was



**TABLE 3-2: SOIL SCREENING SUMMARY**

Facility Name: Truck Fill Stand, NAS Key West

Facility ID#: 449400050

SAMPLE				OVA SCREENING RESULTS			
BORING NO.	DATE COLLECTED	DEPTH TO WATER	SAMPLE INTERVAL (FBLs)	TOTAL READING (ppm)	CARBON FILTERED (ppm)	NET READING (ppm)	COMMENTS
A902-SB01	23-Jun-98	3	0 - 2	120	0	120	
			2 - 4	50	2	48	
A902-SB02	23-Jun-98	3	0 - 2	1200	80	1120	
			2 - 4	380	70	310	
A902-SB03	23-Jun-98	3	0 - 2	280	0	280	
			2 - 4	1700	20	1680	
A902-SB04	23-Jun-98	2	0 - 2	1000	50	950	
			2 - 4	75	50	25	
A902-SB05	23-Jun-98	2	0 - 2	275	60	215	
			2 - 4	80	20	60	
A902-SB06	23-Jun-98	2	0 - 2	200	90	110	
			2 - 4	175	90	85	
A902-SB07	23-Jun-98	3	0 - 2	1600	0	1600	
			2 - 4	1400	0	1400	
A902-SB08	23-Jun-98	3	0 - 2	100	0	100	
			2 - 4	1500	0	1500	
A902-SB09	23-Jun-98	3	0 - 2	280	15	265	
			2 - 4	1000	25	975	
A902-SB10	24-Jun-98	3	0 - 2	1600	20	1580	
			2 - 4	400	0	400	
A902-SB11	24-Jun-98	3	0 - 2	125	0	125	
			2 - 4	3500	30	3470	
A902-SB12	24-Jun-98	3	0 - 2	3400	30	3370	
			2 - 4	NS	NS	NS	
A902-SB13	24-Jun-98	3	0 - 2	1000	0	1000	
			2 - 4	25	15	10	
A902-SB14	24-Jun-98	2	0 - 2	41	35	6	
			2 - 4	NS	NS	NS	
A902-SB15	24-Jun-98	3	0 - 2	14	11	3	
			2 - 4	20	18	2	
A902-SB16	24-Jun-98	3	0 - 2	0	0	0	
			2 - 4	5	4	1	
A902-SB17	24-Jun-98	3	0 - 2	20	5	15	
			2 - 4	60	25	35	
A902-SB18	24-Jun-98	3	0 - 2	125	0	125	
			2 - 4	3400	25	3375	
A902-SB19	24-Jun-98	3	0 - 2	0	0	0	
			2 - 4	3400	10	3390	
A902-SB20	24-Jun-98	3	0 - 2	0	0	0	
			2 - 4	22	5	17	
A902-SB21	24-Jun-98	3	0 - 2	0	0	0	
			2 - 4	1000	0	1000	
A902-SB22	24-Jun-98	3	0 - 2	0	0	0	
			2 - 4	1200	8	1192	
A902-SB23	25-Jun-98	2	0 - 2	0	0	0	
			2 - 4	15	12	3	

**TABLE 3-2: SOIL SCREENING SUMMARY**

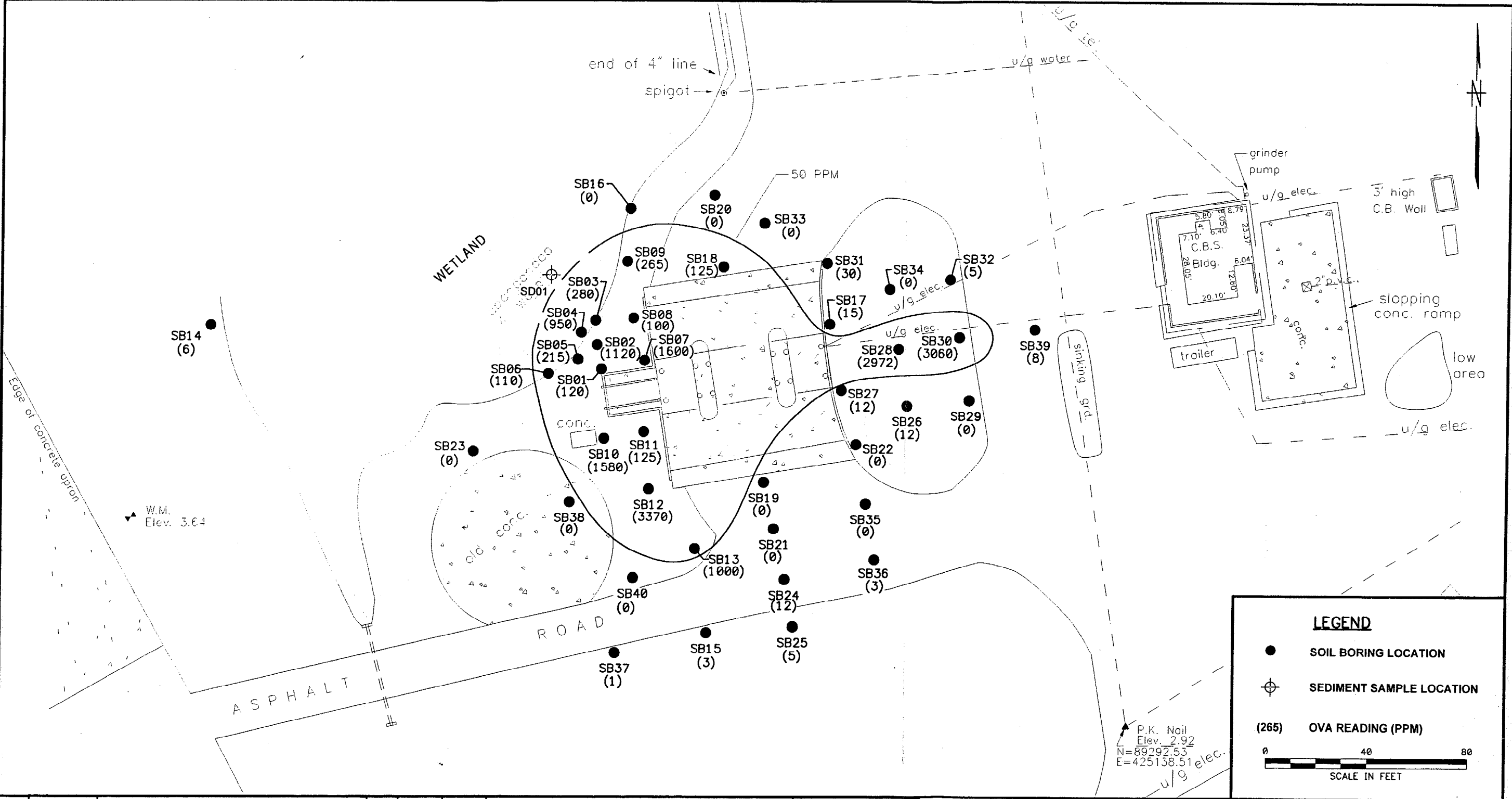
Facility Name: Truck Fill Stand, NAS Key West

Facility ID#: 449400050

SAMPLE				OVA SCREENING RESULTS			
BORING NO.	DATE COLLECTED	DEPTH TO WATER	SAMPLE INTERVAL (FBLs)	TOTAL READING (ppm)	CARBON FILTERED (ppm)	NET READING (ppm)	COMMENTS
A902-SB24	25-Jun-98	3	0 - 2	20	8	12	
			2 - 4	250	20	230	
A902-SB25	25-Jun-98	3	0 - 2	8	3	5	
			2 - 4	55	12	43	
A902-SB26	25-Jun-98	3	0 - 2	15	3	12	
			2 - 4	26	5	21	
A902-SB27	25-Jun-98	3	0 - 2	12	0	12	
			2 - 4	3100	60	3040	
A902-SB28	25-Jun-98	3	0 - 2	3000	28	2972	
			2 - 4	3000	90	2910	
A902-SB29	25-Jun-98	3	0 - 2	0	0	0	
			2 - 4	5	0	5	
A902-SB30	25-Jun-98	3	0 - 2	3100	40	3060	
			2 - 4	3100	45	3055	
A902-SB31	25-Jun-98	3	0 - 2	30	0	30	
			2 - 4	3000	45	2955	
A902-SB32	25-Jun-98	3	0 - 2	5	0	5	
			2 - 4	35	10	25	
A902-SB33	25-Jun-98	3	0 - 2	0	0	0	
			2 - 4	2900	20	2880	
A902-SB34	25-Jun-98	3	0 - 2	0	0	0	
			2 - 4	12	6	6	
A902-SB35	25-Jun-98	3	0 - 2	0	0	0	
			2 - 4	0	0	0	
A902-SB36	25-Jun-98	3	0 - 2	10	7	3	
			2 - 4	5	3	2	
A902-SB37	26-Jun-98	3	0 - 2	6	5	1	
			2 - 4	8	6	2	
A902-SB38	26-Jun-98	3	0 - 2	0	0	0	
			2 - 4	15	12	3	
A902-SB39	26-Jun-98	3	0 - 2	20	12	8	
			2 - 4	200	200	0	
A902-SB40	26-Jun-98	3	0 - 2	0	0	0	
			2 - 4	0	0	0	

NS = No sample collected due to refusal.

ACAD:7586GM02.dwg 12/23/98 KW



**LEGEND**

- SOIL BORING LOCATION
- ⊕ SEDIMENT SAMPLE LOCATION
- (265) OVA READING (PPM)

0 40 80  
SCALE IN FEET

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES	DRAWN BY	DATE
							KW	12/23/98
							CHECKED BY	DATE
							COST/SCHED-AREA	
							SCALE	
							AS NOTED	



**SOIL HEADSPACE ANALYSIS DATA**  
**TRUCK FILL STAND, BUILDING A902**  
**NAVAL AIR STATION, KEY WEST, FLORIDA**

CONTRACT NO. 7586	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 3-2	REV. 0

**TABLE 3-3: SOIL AND SEDIMENT ANALYTICAL SUMMARY****Facility Name: Truck Fill Stand, NAS Key West****Facility ID#: 449400050**

Sample				OVA	Laboratory Analyses										Comments
Boring No.	Date Collected	Depth to Water (ft)	Sample Interval (fbls)	Net OVA Reading (ppm)	Benzene (ppm)	Ethyl-benzene (ppm)	Toluene (ppm)	Total Xylenes (ppm)	Total VOAs (ppm)	MTBE (ppm)	Naphthalene (ppm)	TRPHs (ppm)	Benzo (a) pyrene (ppm)	Dibenzo (a,h) anthracene (ppm)	
SCTL*					1.1	240	300	290	None	350	1,000	350	0.1	0.1	
A902-SB41	25-Aug-98	3	2	125	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<4.0	<0.100	<0.100	Adjacent to SB18 (low OVA)
A902-SB42	25-Aug-98	3	2	265	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<b>490</b>	<b>0.460</b>	<0.100	Adjacent to SB09 (medium OVA)
A902-SB43	25-Aug-98	3	2	1600	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<b>&lt;4.0</b>	<b>&lt;0.100</b>	<0.100	Adjacent to SB07 (high OVA)
A902-SD01	28-Jan-99	N/A	N/A	N/A	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	<0.670	160	<b>&lt;0.670</b>	<b>&lt;0.670</b>	Approx. 25 feet NW of A902-MW02

\* Soil cleanup target levels for direct exposure as specified in Table IV of Chapter 62-770, FAC.

Bold values exceed target levels.

reported above method detection limits, however, the TRPH concentration was below the SCTL. Benzo(a) pyrene and dibenzo(a,h) anthracene were reported at levels below method detection limits, however, the method detection limits were elevated based on the moisture content of the sample. The elevated detection limits were slightly above the SCTL, therefore, it must be assumed that the concentration may be slightly above the SCTL.

### 3.3 WATER QUALITY

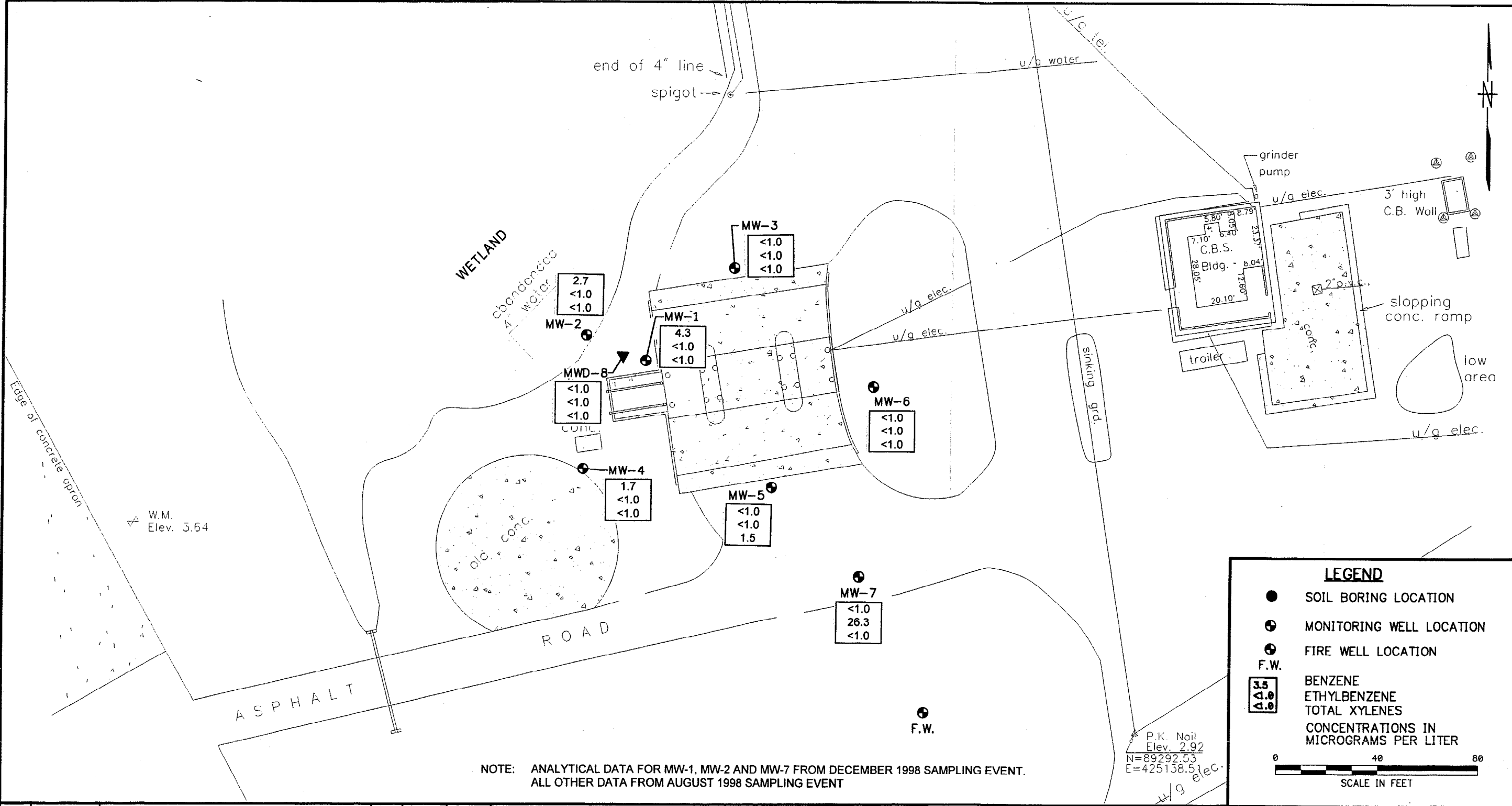
As stated previously, a wetland is located immediately to the northwest of the site. In accordance with Rule 62-770.680, if the sites groundwater contamination is affecting, or may potentially affect a surface water body, then the surface water cleanup criteria shall also apply to groundwater. In addition, the surficial aquifer at the site is classified as a G-III aquifer due to the high total dissolved solids content. Therefore, the GCTLs used for this site are the lower of Tables VII (surface water criteria) and VIII (groundwater of low yield/poor quality) of Chapter 62-770, F.A.C.


Based on the above criteria, laboratory analytical results from groundwater samples collected on August 28 through August 30, 1998 indicate that benzene concentrations in monitoring well A902-MW07 exceeded Chapter 62-770 target levels. The data also indicate that TRPH and PAH concentrations in monitoring wells A902-MW01 and A902-MW02 exceeded target levels. In addition, lead concentrations in monitoring wells A902-MW01, A902-MW02, A902-MW05, and A902-MW07 exceeded target levels.

Laboratory analytical results from groundwater samples collected on December 2, 1998 (subsequent to overdeveloping) indicate that benzene concentrations in monitoring well A902-MW07 had decreased to below method detection limits. In addition, the lead concentration in monitoring wells A902-MW01 and A902-MW02 decreased to below target levels. However, TRPH and PAH concentrations in monitoring wells A902-MW01 and A902-MW02 still exceeded Chapter 62-770 target levels. In addition, the lead concentration in A902-MW07 increased slightly so it now exceeds regulatory target levels by a slight amount.

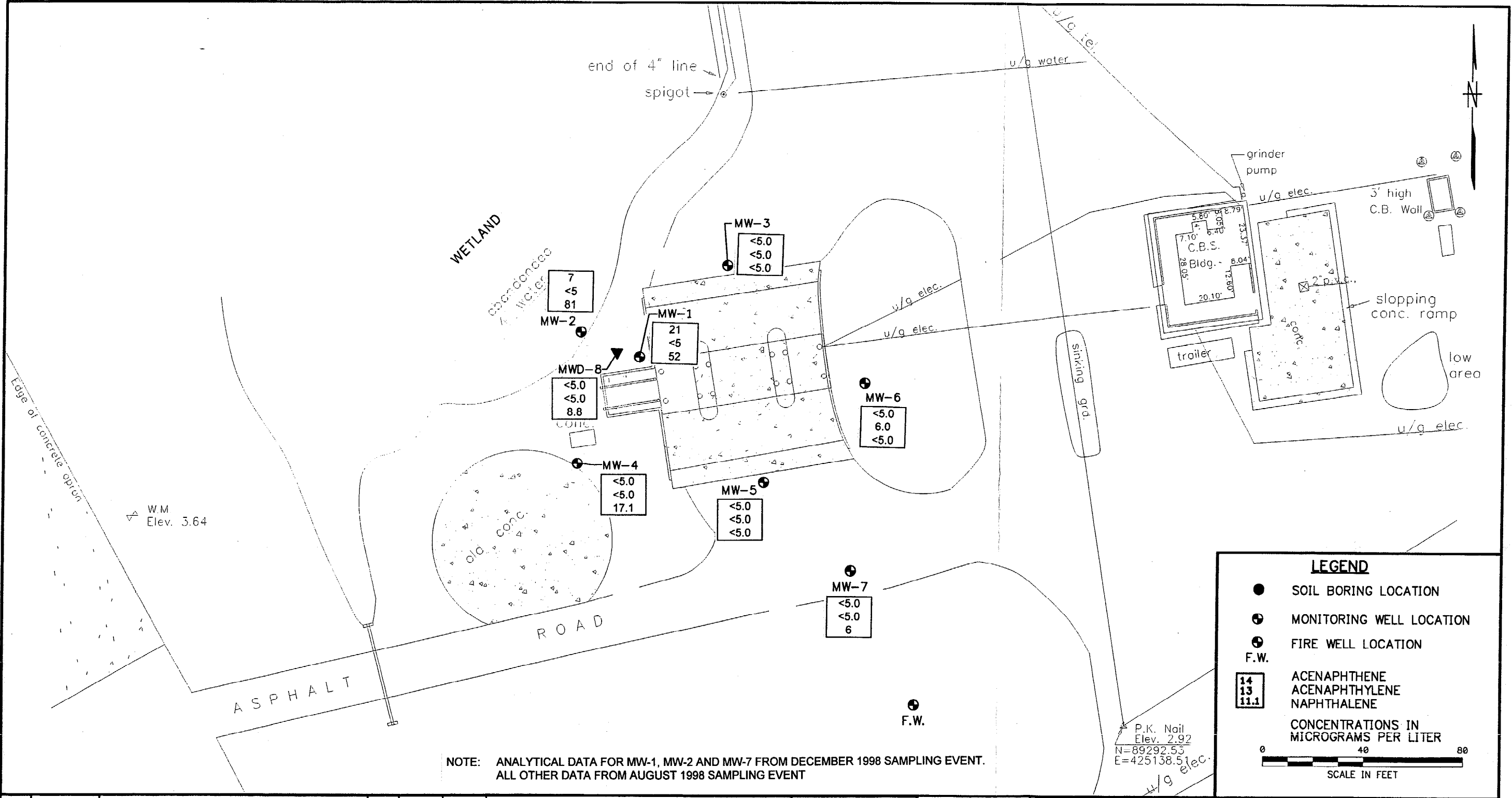
Dissolved VOA concentrations, dissolved PAH concentrations and dissolved TRPH concentrations are provided on Figure 3-3, Figure 3-4 and Figure 3-5 respectively. A summary of groundwater analytical results are presented in Table 3-4. Groundwater laboratory analytical reports are provided in Appendix H.

ACAD:7586GM04.dwg 12/24/98 KW



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES	DRAWN BY	DATE		DISSOLVED VOLATILE ORGANIC AROMATIC TRUCK FILL STAND, BUILDING A902 NAVAL AIR STATION, KEY WEST, FLORIDA	CONTRACT NO. 7586	
											APPROVED BY	DATE
											APPROVED BY	DATE
											DRAWING NO. FIGURE 3-3	REV. 0

ACAD: 7586GM05.dwg 12/23/98 KW



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY	DATE
KW	12/23/98
CHECKED BY	DATE
COST/SCHED-AREA	
SCALE	
AS NOTED	



DISSOLVED POLYNUCLEAR AROMATIC  
HYDROCARBON CONCENTRATIONS  
TRUCK FILL STAND, BUILDING A902  
NAVAL AIR STATION, KEY WEST, FLORIDA

CONTRACT NO. 7586	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 3-4	REV. 0





**TABLE 3-4: GROUNDWATER MONITORING WELL ANALYTICAL SUMMARY**

Facility Name: Truck Fill Stand, Building A902, NAS Key West

Facility ID#: 449400050

Sample Location	Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Total BTEX	MTBE	EDB	Total Lead	TRPHs	Naphthalene	Acenaphthene	Acenaphthylene
Cleanup Target Level(1)		10	40	300	200		35	0.02	150	50	200	200	2100
Marine Surface Water Criteria (2)		71	475	605	370		33600	13	6	5	26	3	0.031
A902-GW-MW01	8/30/98	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<0.02	26	14.8	130	28	20
	12/2/98	4.3	<1.0	<1.0	<1.0	4.3	<1.0	<0.02	4	10.8	52.0	21	<5
A902-GW-DUP(3)	8/30/98	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<0.02	25	10.0	160	28	18
A902-GW-MW02	8/29/98	3.5	<1.0	<1.0	<1.0	3.5	<5.0	<0.02	<3	5.9	11.1	14.0	13.0
	12/2/99	2.7	<1.0	<1.0	<1.0	2.7	<1.0	<0.02	3	5.8	81.0	7	<5
A902-GW-MW03	8/29/98	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<0.02	5	1.0	<5.0	<5.0	<5.0
	12/2/98	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
A902-GW-MW04	8/29/98	1.7	<1.0	<1.0	<1.0	1.7	<5.0	<0.02	<3	2.8	17.1	<5.0	<5.0
	12/2/98	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
A902-GW-MW05	8/29/98	<1.0	<1.0	<1.0	1.5	1.5	<5.0	<0.02	11	1.1	<5.0	<5.0	<5.0
	12/2/98	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
A902-GW-MW06	8/29/98	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<0.02	8	1.8	<5.0	<5.0	6.0
	12/2/98	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
A902-GW-MW07	8/28/98	25.6	<1.0	38.4	2.5	66.5	<5.0	<0.02	4	<0.1	<5.0	<5.0	<5.0
	12/2/99	<1.0	<1.0	26.3	<1.0	26.3	<1.0	<0.02	9	0.3	6.00	<5	<5
A902-GW-MW08	8/30/98	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<0.02	4	0.5	8.8	<5.0	<5.0
	12/2/98	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
A902-GW-EQ(4)	8/30/98	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<0.02	<3	<0.1	<5.0	<5	<5
A902-TB(5)	8/30/98	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<0.02	NA	NA	NA	NA	NA

## NOTES:

(1)Groundwater cleanup target levels as specified in Table VIII of Chapter 62-770, Florida Administrative Code.

(2)Marine surface water criteria as specified in table VII of Chapter 62-770, Florida Administrative Code.

(3)This groundwater sample is a duplicate sample collected from A902-GW-MW01.

(4)This sample is an equipment rinsate blank.

(5)This sample is a trip blank analyzed for volatile organic aromatics only.

Concentrations reported in micrograms per liter for all chemicals except TRPH. TRPH is reported in milligrams per liter.

NA = not analyzed.

TRPH = total recoverable petroleum hydrocarbons.

Bold values exceed target levels.

## 4.0 DISCUSSION

"Excessively contaminated" soil, as defined by Chapter 62-770.200 F.A.C., was detected within the vadose zone during this investigation. The "excessively contaminated soil" was identified from near the surface to the water table at an average depth of approximately 3 feet bls in the vicinity of the former UST location to the west of the dispenser island, as well as a smaller area to the east of the dispenser island. The "excessively contaminated" soil detected to the east of the dispenser island corresponds to the location where a release reportedly occurred when a tanker truck collided with the canopy support (see Section 1.3.1). The presence of petroleum related compounds in the vadose zone was confirmed by laboratory analysis. No free product was encountered during the this investigation.

Laboratory analytical results indicate that benzene concentrations are below regulatory target levels in all of the sites monitoring wells. TRPH and PAH concentrations exceed regulatory target levels in monitoring wells A902-MW01 (source well) and A902-MW02 (downgradient well). In addition, lead concentrations exceed regulatory target levels in monitoring wells A902-MW01, A902-MW02, A902-MW05 and A902-MW07. A comparison of the August 1998 analytical results with the December 1998 results suggest that overdeveloping was successful at reducing the benzene concentration in monitoring well A902-MW07, however, it was less effective at reducing the TRPH and PAH concentrations in monitoring wells A902-MW01 and A902-MW02. With the exception of low lead levels in the upgradient well, A902-MW07, the horizontal extent of the dissolved hydrocarbon plume appears to be delineated in all directions except downgradient. The vertical extent of the dissolved hydrocarbon plume has been delineated. The petroleum hydrocarbon concentrations detected in downgradient monitoring well A902-MW02, along with the low levels of petroleum compounds detected in the sediment sample collected from the wetland, suggest that the plume is migrating into the wetland. Additional assessment will be required to confirm this.

Depth to water in the surficial aquifer was determined to be approximately 3 feet bls. A subsurface utility cable was identified on the east side of the dispenser island. The distribution of the elevated headspace readings to the east of the dispenser island suggests that this cable may be acting as a preferential pathway for migration of contaminants. The predominant direction of groundwater flow for the surficial aquifer is to the northwest, toward the wetland. Results from the tidal survey suggest that there is a minimal tidal influence on the surficial aquifer in the vicinity of the site. The groundwater flow velocity was calculated at 0.02 feet/day. The total dissolved solids

content in the surficial aquifer in the area of NAS qualifies the aquifer as a G-III aquifer (Chapter 62-3.403 F.A.C.).

No well fields and surface water intakes which supply drinking water to the local area are located within a 0.50-mile radius of the site. No domestic water wells were identified within 0.25-mile of the site.

## 5.0 CONCLUSIONS AND RECOMMENDATION

The results of the site assessment performed by TtNUS at the Truck Fill Stand are summarized as follows:

- The tank closure report noted that the tank appeared in excellent condition with no signs of leaks. The areal extent of petroleum contamination along with the condition of the tank suggests that the contamination may be from a different source or from spillage.
- The site is underlain by a surficial aquifer comprised of oolitic limestone. No confining layers were encountered within the upper 35 feet of the surficial aquifer.
- The surficial aquifer qualifies as a G-III aquifer.
- The direction of groundwater flow is to the northwest, however, a tidal survey suggests that there is a minimal tidal influence on the surficial aquifer. The surficial aquifer flows at a calculated velocity of 0.02 feet/day.
- The horizontal extent of the dissolved hydrocarbon plume has been delineated in all directions except downgradient, (with the exception of low lead levels in the upgradient well, A902-MW07). The vertical extent of the dissolved hydrocarbon plume had been adequately defined.
- Free product was not found at the site during the course of this assessment.
- No private potable wells were found within a 0.25-mile radius of the site. No municipal wells were found within a 0.5-mile radius of the site.
- TRPH, PAHs, and lead are the detected petroleum constituents that exceed Chapter 62-770, F.A.C., target limits in groundwater.

Based upon the hydrogeological and chemical data presented in this SAR and supported by the criteria cited in Chapter 62-770, F.A.C., the site does not qualify for No Further Action or Natural Attenuation Monitoring. Therefore, Tetra Tech NUS, Inc. proposes that a source removal action be initiated to remediate the excessively contaminated soil at the site. Subsequent to source removal, a supplemental assessment should be conducted to evaluate the impact of the source removal on the dissolved hydrocarbon concentrations.

## 6.0 REFERENCES

- ABB-ES (ABB Environmental Services, Inc.), 1995. Facility and Remedial Investigation NAS Key West, Workplan, Volume 1 and Sampling and Analysis Plan, Volume 2, prepared for SOUTHNAVAFACENGCOM, Tampa, Florida, December 1995
- BRE (Brown & Root Environmental), 1997. Draft Supplemental RCRA Facility Investigation and Remedial Investigation Report for NAS Key West High-Priority Sites, prepared for the Department of Navy, Southern Division, Naval Facilities Engineering Command, Aiken, South Carolina, Revision 2, March 1997.
- IT Corporation, 1993. RCRA Facility Investigation/Remedial Investigation, Final Workplan and Sampling and Analysis Plan, NAS Key West, Boca Raton, Florida, prepared for SOUTHNAVAFACENGCOM, Tampa, Florida, March.
- Kasenow, M. and Pare, 1995. Using Specific Capacity to Estimate Transmissivity: Field and Computer Methods. Water Resources.
- Theis, C.V., 1935. The relation between the lowering of piezometric surface and the rate and duration of discharge of a well using ground-water storage. Transactions of the American Geophysical Union, v.16.
- Turcan, A.N., Jr., 1962. Estimating the specific capacity of a well. US Geological Survey Professional Paper 450-E.
- Omega Environmental Services, 1995. UST Closure Report, Tank A902B, Naval Air Station, Key West, Florida.
- U.S. Geological Survey. Boca Chica, FLA., Quadrangle 1971, 7.5 minute series, Topographic Quadrangle Maps of Florida: scale 1:24,000.

**APPENDIX A**

**CAR SUMMARY SHEET**

# CONTAMINATION ASSESSMENT REPORT SUMMARY SHEET

Facility Name: Truck Fill Stand, NAS Key West

Reimbursement Site: ☐

Location: Key West, Florida

State Contract Site: ☐

EDI #: \_\_\_\_\_ FAC I.D.# 449400050

Other: Non-Prog. ☒

Date Reviewed: \_\_\_\_\_ Local Government: \_\_\_\_\_

(1) Source of Spill: Fuel filter decanter tank

Date of Spill: Unknown

(2) Type of Product:

Gasoline Group

Gallons Lost

Kerosene Group

Gallons Lost

☐ Leaded

☐ Kerosene

☐ Unleaded Regular

☐ Diesel

☐ Unleaded Premium

☒ JP-4 Jet Fuel

Unknown

☐ Gasohol

☐ Jet A Fuel

☐ Undetermined

☐ Unknown

(3) Description of IRA: Soil from tank excavation removed

☐ Free product Removal:

(gals)

adjacent to building but discontinued due to potential

☒

Soil Removal:

24

(cubic yds)

impact to structural integrity of building.

☐

Soil

(cubic yds)

Incineration:

(4) Free Product still present (yes/no) No

Maximum apparent product thickness: N/A

(feet)

(5) Maximum Groundwater contamination levels (ppb):

Total VOA: 26.3

benzene: 4.3

EDB: < 0.020

lead: 11

MTBE: <5.0

other: TRPH & PAHs

(6) Brief lithologic description: Oolitic limestone. No significant lithologic variations across site.

(7) Areal and vertical extent of soils contamination defined (yes/no)

Yes

Highest current soil concentration (OVA: 3370 ppm) or (EPA method 5030/8020: \_\_\_\_\_ ppb)

(8) Lower aquifer contaminated? (yes/no)

No

Depth of vertical contamination:

Less than 35 feet.

(9) Date of last complete round of groundwater sampling: 8/30/98

Date of last soil sampling: 6/26/98

(10) QAPP approved? (yes/no) Date: 8/24/98

(11) Direction (e.g. NNW) of surficial groundwater flow: NW

(Figure 3-1 on page 3-3)

(12) Average depth to groundwater: 3

(ft)

(13) Observed range of seasonal groundwater fluctuations: @ 1

(ft) (Based on water level data collected during the CAR investigation)

(14) Estimated rate of groundwater flow: 0.02

(ft/day)

(15) Hydraulic gradient across site: 0.001

(ft/ft)

(16) Aquifer characteristics:

Values

Units

Method

Hydraulic conductivity

4.34

ft/day

Kasenow & Pare, 1995

Storage coefficient

-

ft/ft

-

Aquifer thickness

40

ft

Literature

Effective soil porosity

30

%

Literature

Transmissivity

1307

gal/day/ft

Specific Capacity Tests

(17) Other remarks: None

## **APPENDIX B**

### **TANK CLOSURE REPORT**



COPY

OMEGA ENVIRONMENTAL SERVICES, INC.

UST CLOSURE REPORT  
TANK A902B  
NAVAL AIR STATION, KEY WEST, FLORIDA  
CONTRACT NUMBER N62467-93-C-0645

A935

3-6-97

Dup - return to Jim

Paul -  
Please return this  
copy to me.  
Thanks,  
Jim

PAUL CALLIGAN  
c/o BROWN ROOT  
1311 EXECUTIVE CENTER DR.  
ELLIS BLDG. SUITE 220  
TALAHASSEE, FL 32301-5067



OMEGA ENVIRONMENTAL SERVICES, INC.

Prepared By  
Omega Environmental Services, Inc.  
4661 Hammermill Rd., Ste. B  
Tucker, Georgia 30084



OMEGA ENVIRONMENTAL SERVICES, .

4661 Hammermill Rd. Suite B Tucker, GA 30084  
Fax: (404) 934-2451 Tel: (404) 621-9414

October 25 , 1995

Subject:       Underground Storage Tank Closure  
              Naval Air Station, Key West, Florida  
              Tank A902B  
              Contract No. N62467-93-C-0645

Omega Environmental Services is pleased to submit this closure report and Closure Assessment form 17-176.900(6) to Mark Ewing, Key West, NAS Project Manager. We recommend that this report be submitted to the following offices.

Florida Department of Environmental Regulations  
South District Office  
2269 Bay Street  
Ft. Myers, Florida 33901-2896

Bob Turner  
Monroe County Public Health Services  
P. O. Box 6193  
Key West, Florida 33041-6193

It is my professional opinion that this report meets the Florida Department of Environmental Regulations reporting requirements for Underground Storage Systems, and also meets the specifications required by the Department of the Navy described in contract N62467-93-C-0645, Section 02082, p.3.23 (Closure Reports).

Omega Environmental Services greatly appreciates the opportunity to assist Naval Air Station, Key West, Florida in the Closure of the underground storage tanks associated with this project. If you have any questions do not hesitate to call for further assistance.

Sincerely,

A handwritten signature in black ink, appearing to read "C. H. Moss".

C. H. Moss, PE  
Professional Engineer

## Table of Contents

<u>Item No.</u>	<u>Description</u>	<u>Page No.</u>
1.0 .....	Site Information .....	1
2.0.....	UST Removal .....	1
3.0.....	OVA Soil Screening.....	1
4.0.....	Conclusions.....	2

## Appendices

Appendix 1 .....	Site Plan and Sample Location
Appendix 2.....	Soil Screening Data
Appendix 3.....	FDER Closure Assessment Form
Appendix 4.....	Ground water Analysis
Appendix 5.....	Certificates of Disposal
Appendix 6.....	Public Work Permits
Appendix 7.....	Progress Photographs

## **1.0 Site Information**

On September 28, 1995 Omega Environmental Services removed one underground storage tank, [ A902B ] located at the Boca Chica Naval Air Station, Fuel Farm Fill Station, in Key West, Florida. The tank was constructed of plate steel and had a capacity of one thousand gallons. The tank was used for water canting storage from the JP 5 fuel filter system located at the fuel farm. The tank was reported to be installed in 1990.

Omega Environmental Services was contracted by the U. S. Navy to remove the tanks and associated piping in the excavation and compile all associated reporting and site closure information. The ground water was assessed to be less than twenty feet from the surface which required sampling to comply with FDER regulations. The installation of a ground water monitoring well was performed after the removal process and the samples were sent to Envirolab, Ormond Beach, Florida for analysis.

Due to the tank being located in a photograph restricted area no photos of the site or tank removal will be available for this report.

## **2.0 UST Removal**

On September 26, 1995 OES contracted EMC Corporation to remove the liquid from tank A902B. On September 28, 1995 OES prepared the location for removal of the tank. The soil was removed to expose the top of tank which was three feet below the ground surface. The supply piping was rinsed and disconnected from the tank. and removed. The vent piping was completely removed from the tank and building. The soil was excavated, with a backhoe, down each side of the tank and across the ends of the tank. The tank was checked for the presence of a hazardous atmosphere and found to be safe for removal. The tank was removed from the excavation and loaded onto a truck for transport to a lay down area for processing for recycling. Omega Environmental Services then backfilled the excavation with fill dirt compacting the soil back to the original grade in one foot lifts.

## **3.0 Soil Screening**

The Soil was tested for total hydrocarbons using a Foxboro 108 FID Monitor by John Fleming of OES. Sampling was conducted throughout the removal process on the soil. The monitor was allowed to warm up for twenty minutes before calibration. 98 ppm Methane gas was used to calibrate the instrument before testing. The background reading was recorded in the area before sampling was initiated. Samples were taken using latex gloves and placed in pint jars with an aluminum foil cover. The samples were then placed in an ice chest to allow the temperature to equalize. The location of the side wall samples were chosen to be the closest to the tank with a depth that would most likely be contaminated by leaking fuel. Sampling was conducted at the top of the groundwater level to detect any fuel floating on the water. Samples were taken along the piping and at the fill ports and other locations as specified by the FDER. The samples were numbered and locations recorded along with other information. The samples were then screened

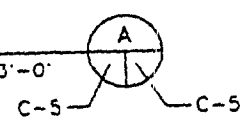
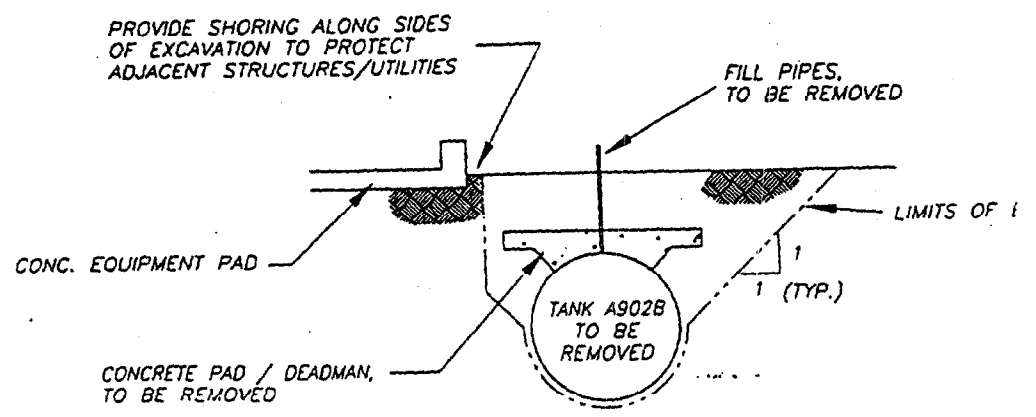
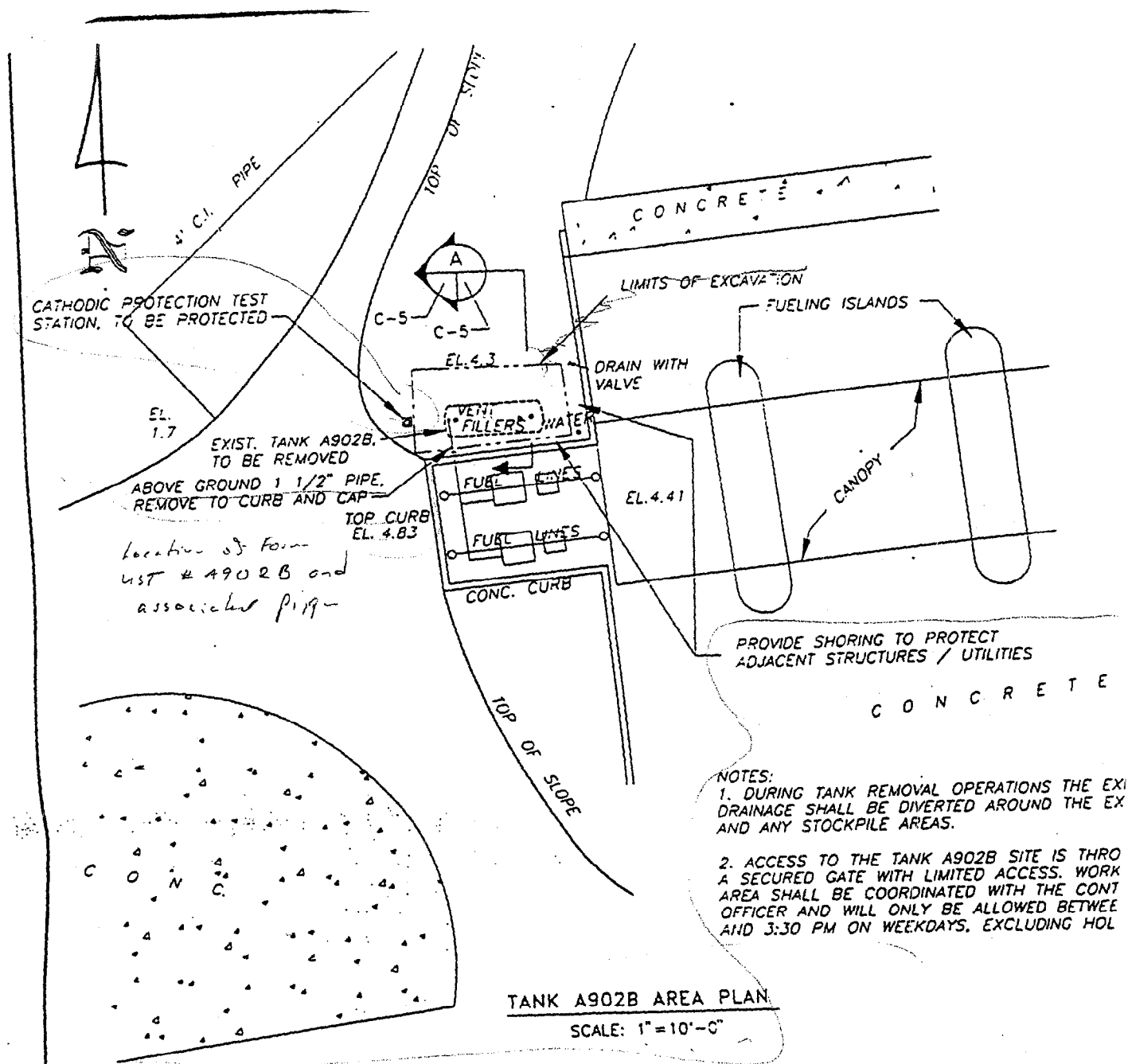
using the Foxsboro 108 and the sample data recorded. The sample results are listed in Appendix 2 of this document. All data was recorded in a bound field log at the time of sampling and the field log is available upon request for review by Regulatory Agencies. The sample locations are indicated on the site plan, Appendix 1. Head-space sampling was performed in accordance with FDER Quality Assurance Standard Operating Procedures for Petroleum Storage System Closure Assessments, Section III and IV respectively.

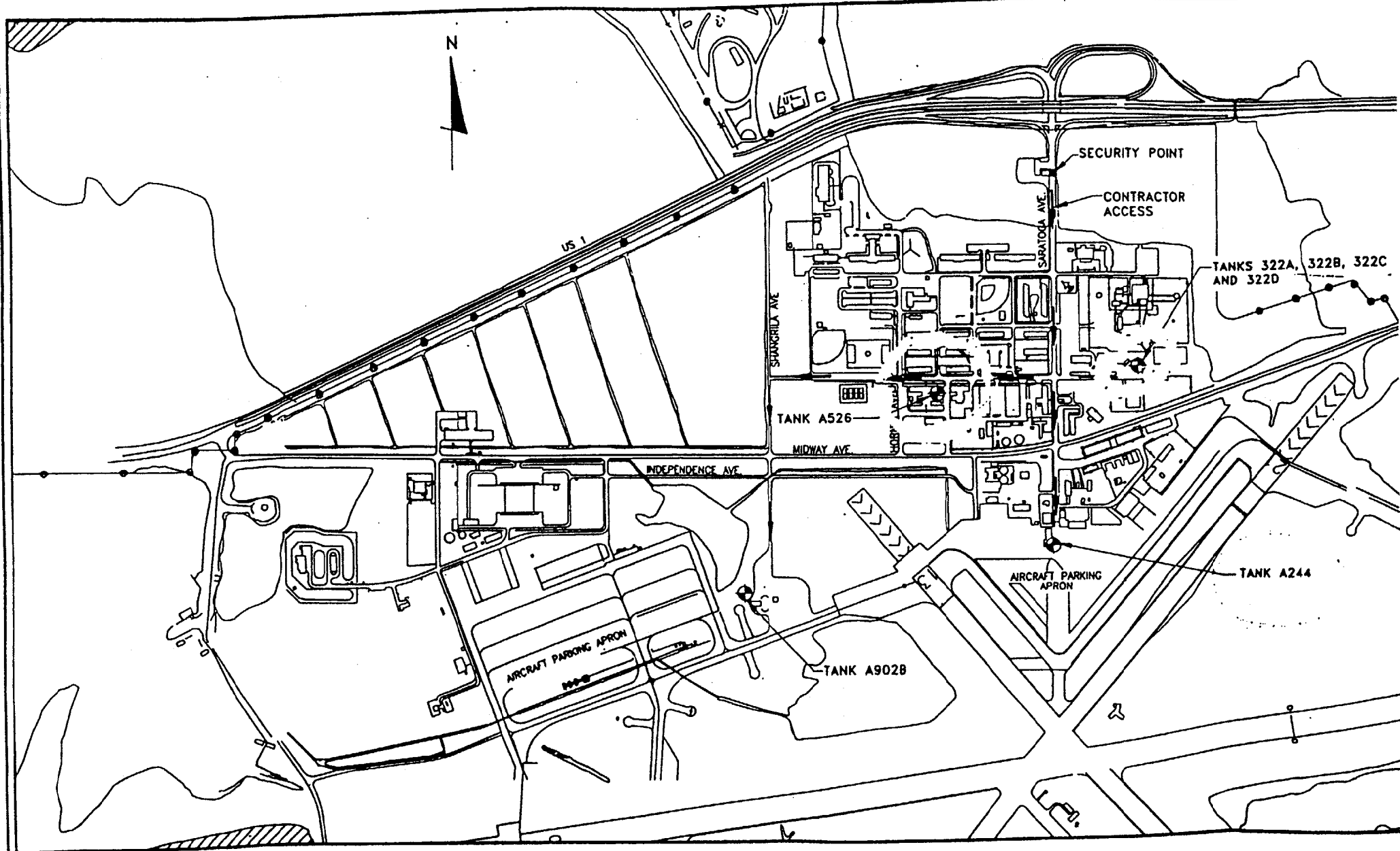
Water samples were taken after the monitoring well was installed. Two inch PVC piping was used for the monitoring well and it was installed by Omega Environmental Services.. After installation of the well 15 gallons of water was pumped from the well, five times the volume, and the sample bottles were filled for analysis. The well was removed after all samples were taken. The samples were shipped, with ice as a preservative, by Federal Express with a Chain of Custody to Envirolab, Ormond Beach, Florida. Sample results are listed in Appendix 4.

#### 4.0 Conclusions

Based on discussions with Bob Turner [Monroe County Health Department] we are of the opinion that the tanks were closed in accordance with FAC Chapter 62-761 Underground Storage Tank Systems. The ground water analysis showed high levels of Polynuclear Aromatic Hydrocarbons and Aromatic Volatiles such as Benzene, Ethylbenzene, and Xylene. OVA readings of the soil revealed contamination and the site appeared contaminated before OES started excavation. Free fuel was present on the ground water in the excavation during the removal of the tank. The tank appeared in excellent condition with no sign of leaks. It is Omega Environmental Services opinion that the contamination found in the ground water may have come from a different source or from spillage. Due to the amount of soil contaminated in the area and the Navy's consideration of plans to remediate the area OES was directed to replace the soil as backfill. Based upon the limited information compiled during the tank removal process OES must report the contamination source as unknown. OES recommends that further investigation of the contamination be conducted by the Navy to determine the source and location of the contamination and options to remediate the area.

**APPENDIX 1**





# BOCA CHICA AREA PLAN

(TANKS A244, 322A, 322B, 322C, 322D, A526, AND A902B)

SCALE: 1" =

FORT ZACHARY TAYLOR

PIER D3

TANKS B14A AND B14B

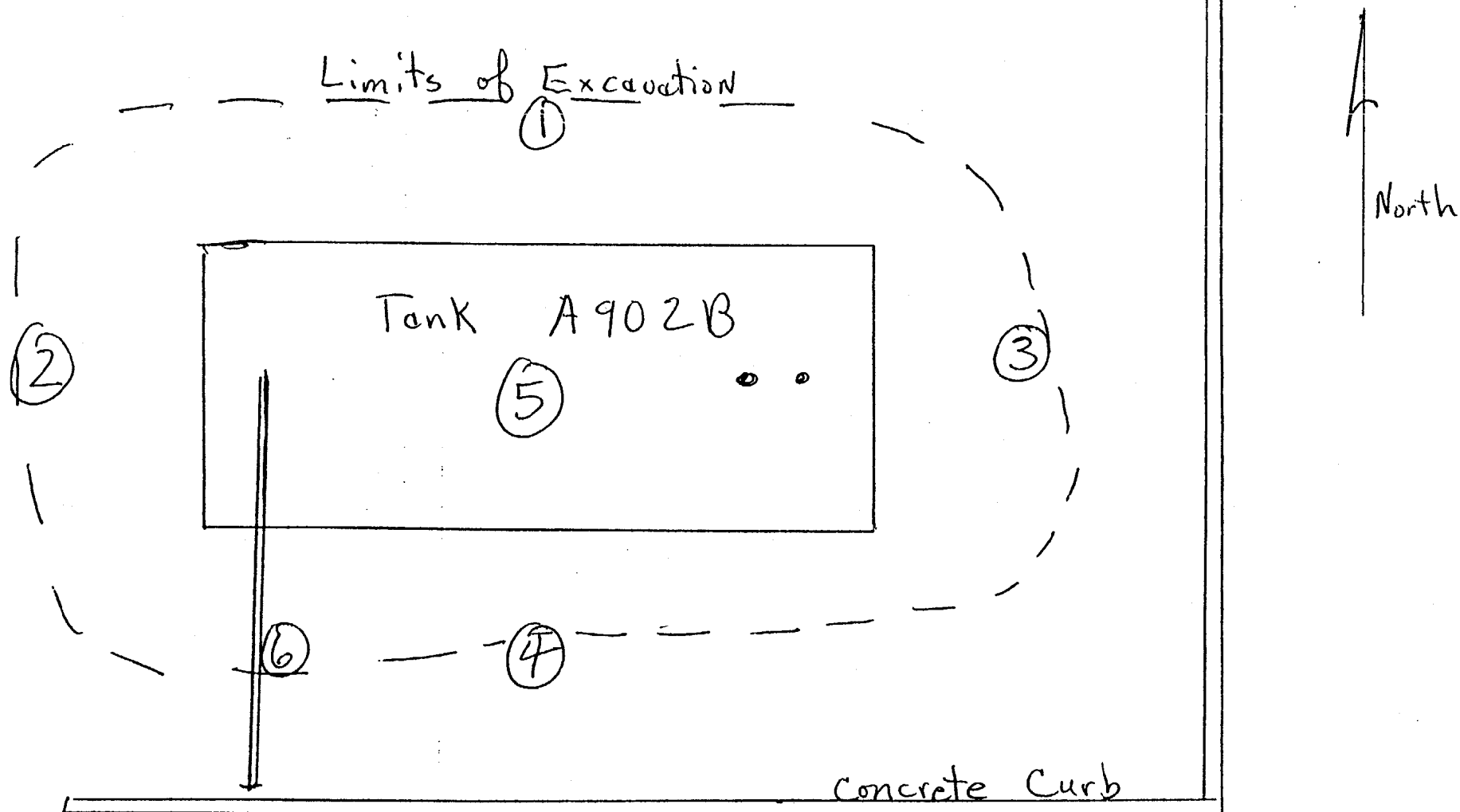
FLEMING KEY



**APPENDIX 2**

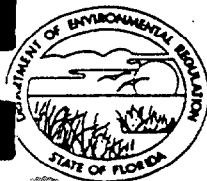
## OVA Field Data Sheet

Project Name Key West NAS				Contract Number N62467-93-C-0645		Comments JP 5 Canting tank		
Site Name or Number A902B			Date 28-Sep-95					
Calibration Information		Date	28-Sep-95		Time			
Instrument Foxsboro 108				Calibration Gas Methane Standard		Sample Technician John Fleming		
Actual Concentration 98			Measured Concentration 98			All Readings Measured in Parts per Million		
Sample Number	Sample Location	Sample Method	Sample Temperature	Date Sampled	Time Sampled	OVA Reading	Methane Reading	Corrected Reading
1	North Wall	Grab	85` f.	28-Sep-95	2:30pm	150.00	0.00	150.00
2	West Wall	Grab	85` f.	28-Sep-95	2:30pm	180.00	0.00	180.00
3	East Wall	Grab	85` f.	28-Sep-95	2:30pm	200.00	0.00	200.00
4	South Wall	Grab	85` f.	28-Sep-95	2:30pm	150.00	0.00	150.00
5	Under Tank	Grab	85` f.	28-Sep-95	2:30pm	250.00	0.00	250.00
6	Piping	Grab	85` f.	28-Sep-95	2:30pm	150.00	0.00	150.00



Sample #	Depth
1	3 ft BGS
2	3 ft BGS
3	3 ft BGS
4	3 ft BGS
5	8 ft BGS
6	2 ft BGS

**APPENDIX 3**



# Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

DER Form #	17-761.900(6)
Form Title	Closure Assessment Form
Effective Date	December 10, 1990
DER Application No.	(Filed in by DER)

## Closure Assessment Form

Owners of storage tank systems that are replacing, removing or closing in place storage tanks shall use this form to demonstrate that a storage system closure assessment was performed in accordance with Rule 17-761 or 17-762, Florida Administrative Code. Eligible Early Detection Incentive (EDI) and Reimbursement Program sites do not have to perform a closure assessment.

Please Print or Type  
Complete All Applicable Blanks

- Date: 10-12-95
- DER Facility ID Number: 449400050
- County: Monroe
- Facility Name: Boca Chica Fuel Farm Fill Station
- Facility Owner: U.S. Navy
- Facility Address: Building 902
- Mailing Address: Naval Air Station Key West, FL 33040-5000
- Telephone Number: (305) 293-2030
- Facility Operator: Jim Simmons
- Are the Storage Tank(s): **(Circle one or both)** A. Aboveground or **(B)** Underground
- Type of Product(s) Stored: Diesel
- Were the Tank(s): **(Circle one)** A. Replaced **(B)** Removed C. Closed in Place D. Upgraded (aboveground tanks only)
- Number of Tanks Closed: 1
- Age of Tanks: 5 years

## Facility Assessment Information

Yes No Not Applicable

<input type="checkbox"/>	<input type="checkbox"/>	NA
<input type="checkbox"/>	<input checked="" type="checkbox"/>	

1. Is the facility participating in the Florida Petroleum Liability Insurance and Restoration Program (FPLIRP)?

2. Was a Discharge Reporting Form submitted to the Department?

If yes, When: \_\_\_\_\_ Where: \_\_\_\_\_

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3. Is the depth to ground water less than 20 feet?

4. Are monitoring wells present around the storage system?

If yes, specify type: ☐ Water monitoring ☐ Vapor monitoring

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5. Is there free product present in the monitoring wells or within the excavation?

6. Were the petroleum hydrocarbon vapor levels in the soils greater than 500 parts per million for gasoline?

Specify sample type: ☐ Vapor Monitoring wells ☐ Soil sample(s)

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Were the petroleum hydrocarbon vapor levels in the soils greater than 50 parts per million for diesel/kerosene?

Specify sample type: ☐ Vapor Monitoring wells ☒ Soil sample(s)

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Were the analytical laboratory results of the ground water sample(s) greater than the allowable state target levels? (See target levels on reverse side of this form and supply laboratory data sheets)

9. If a used oil storage system, did a visual inspection detect any discolored soil indicating a release?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

10. Are any potable wells located within 1/4 of a mile radius of the facility?

11. Is there a surface water body within 1/4 mile radius of the site? If yes, indicate distance: 1/2 Mile



# Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

DER Form #	17-761.800(5)
Form Title	Underground Storage Tank Installation & Removal Form for Certified Contractors
Effective Date	December 10, 1990
DER Application No.	(Filled in by DER)

## Underground Storage Tank Installation and Removal Form For Certified Contractors

Pollutant Storage System Specialty Contractors as defined in Section 489.113, Florida Statutes (Certified contractors as defined in Section 17-761.200, Florida Administrative Code) shall use this form to certify that the installation, replacement or removal of the storage tank system(s) located at the address listed below was performed in accordance with Department Reference Standards.

### General Facility Information

- DER Facility Identification No.: 449400050
- Facility Name: Boca Chica Fuel Farm Fill Station Telephone: (305) 293-2881
- Street Address (physical location): Building 902  
Naval Air Station, Key West, FL 33040-5000
- Owner Name: Commanding Officer (Code 1883) Telephone: (305) 293-2881
- Owner Address: Naval Air Station, Key West, FL 33040
- Number of Tanks: a. Installed at this time \_\_\_\_\_ b. Removed at this time 1 Tank A902B
- Tank(s) Manufactured by: \_\_\_\_\_
- Date Work Initiated: 9-27-95 9. Date Work Completed: 10-11-95

### Underground Pollutant Tank Installation Checklist

Please certify the completion of the following installation requirements by placing an (X) in the appropriate box.

- The tanks and piping are corrosion resistant and approved for use by State and Federal Laws. ☐
- Excavation, backfill and compaction completed in accordance with NFPA (National Fire Protection Association) 30(87), API (American Petroleum Institute) 1615, PEI (Petroleum Equipment Institute) RP100-87 and the manufacturers' specifications. ☐
- Tanks and piping pretested and installed in accordance with NFPA 30(87), API 1615, PEI/RP100(87) and the manufacturers' specifications. ☐
- Steel tanks and piping are cathodically protected in accordance with NFPA 30(87), API 1632, UL (Underwriters Laboratory) 1746, STI (Steel Tank Institute) R892-89 and the manufacturer's specifications. ☐
- Tanks and piping tested for tightness after installation in accordance with NFPA 30(87) and PEI/RP100-87. ☐
- Monitoring well(s) or other leak detection devices installed and tested in accordance with Section 17-761.640, Florida Administrative Code (F.A.C.) ☐
- Spill and overfill protection devices installed in accordance with Section 17-761.500, F.A.C. ☐
- Secondary containment installed for tanks and piping as applicable in accordance with Section 17-761.500, F.A.C. ☐

**Please Note:** The numbers following the abbreviations (e.g. API 1615) are publication or specification numbers issued by these institutions:

### Underground Pollutant Tank Removal Checklist

- Closure assessment performed in accordance with Section 17-761.800, F.A.C. ; ☒
- Underground tank removed and disposed of as specified in API 1604 in accordance with Section 17-761.800, F.A.C. ☒

**APPENDIX 4**

OMEGA ENVIRONMENTAL SERVICES  
4661 HAMMERMILL ROAD, SUITE B  
TUCKER, GA 30084  
Attn: M. DOUG DRIVER



ANALYTICAL REPORT

Page 1

Submission Number: 9509000339  
Date Received: 09/29/95  
Date Reported: 10/10/95

Client's P.O. Number:  
Project Number: 95012  
Project Name: KEY WEST NAS

Lab Sample Number: 9339 23  
Client Sample Number: A902B  
Sample Description: GROUND WATER

Date Sampled: 09/28/95  
Sample Matrix: GROUND WATER

Method	Analyte	Result	Q	Unit	Analyst	Date Analyzed	Date Prepared
418.1	TRPH	1500		MG/L	LL	10/05/95	
239.1	LEAD	0.26		MG/L	BB	10/09/95	
<u>POLYNUCLEAR AROMATIC HYDROCARBONS</u>							
610	ACENAPHTHENE	< 20	D	UG/L	ODL	10/02/95	09/29/95
610	ACENAPHTHYLENE	< 30	D	UG/L	ODL	10/02/95	09/29/95
610	ANTHRACENE	< 20	D	UG/L	ODL	10/02/95	09/29/95
610	BENZ(A)ANTHRACENE	< 20	D	UG/L	ODL	10/02/95	09/29/95
610	BENZO(A)PYRENE	< 20	D	UG/L	ODL	10/02/95	09/29/95
610	BENZO(B)FLUORANTHENE	< 20	D	UG/L	ODL	10/02/95	09/29/95
610	BENZO(G,H,I)PERYLENE	< 20	D	UG/L	ODL	10/02/95	09/29/95
610	BENZO(K)FLUORANTHENE	< 20	D	UG/L	ODL	10/02/95	09/29/95
610	CHRYSENE	< 20	D	UG/L	ODL	10/02/95	09/29/95
610	DIBENZO(A,H)ANTHRACENE	< 20	D	UG/L	ODL	10/02/95	09/29/95
610	FLUORANTHENE	< 20	D	UG/L	ODL	10/02/95	09/29/95
610	FLUORENE	< 20	D	UG/L	ODL	10/02/95	09/29/95
610	INDENO(1,2,3-CD)PYRENE	< 20	D	UG/L	ODL	10/02/95	09/29/95
610	1-METHYLNAPHTHALENE	910	D	UG/L	ODL	10/02/95	09/29/95
610	2-METHYLNAPHTHALENE	1300	D	UG/L	ODL	10/02/95	09/29/95
610	NAPHTHALENE	550	D	UG/L	ODL	10/02/95	09/29/95
610	PHENANTHRENE	< 20	D	UG/L	ODL	10/02/95	09/29/95
610	PYRENE	< 20	D	UG/L	ODL	10/02/95	09/29/95
504.1	ETHYLENE DIBROMIDE	<0.010		UG/L	VRP	09/29/95	09/29/95
<u>GAG AND KAG AROMATIC VOLATILES</u>							
602	BENZENE	2.2		UG/L	RM	10/04/95	
602	CHLOROBENZENE	<0.50		UG/L	RM	10/04/95	
602	1,2-DICHLOROBENZENE	<0.50		UG/L	RM	10/04/95	
602	1,3-DICHLOROBENZENE	<0.50		UG/L	RM	10/04/95	
602	1,4-DICHLOROBENZENE	<0.50		UG/L	RM	10/04/95	
602	ETHYLBENZENE	120		UG/L	RM	10/04/95	
602	METHYL tert-BUTYL ETHER	<0.50		UG/L	RM	10/04/95	



OMEGA ENVIRONMENTAL SERVICES  
4661 HAMMERMILL ROAD, SUITE B  
TUCKER, GA 30084  
Attn: M. DOUG DRIVER



ANALYTICAL REPORT

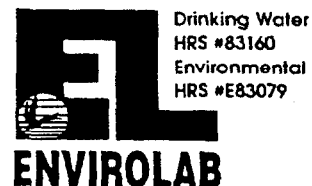
Page 2

Submission Number: 9509000339      Client's P.O. Number:  
Date Received: 09/29/95      Project Number: 95012  
Date Reported: 10/10/95      Project Name: KEY WEST NAS

Lab Sample Number: 9339 23      Date Sampled: 09/28/95  
Client Sample Number: A902B      Sample Matrix: GROUND WATER  
Sample Description: GROUND WATER

Method	Analyte	Result	Q	Unit	Analyst	Date Analyzed	Date Prepared
<u>GAG AND KAG AROMATIC VOLATILES</u>							
602	TOLUENE	2.2		UG/L	RM	10/04/95	
602	o-XYLENE	150		UG/L	RM	10/04/95	
602	m-XYLENE	62		UG/L	RM	10/04/95	
602	p-XYLENE	62		UG/L	RM	10/04/95	
<u>GAG AND KAG HALOGENATED VOLATILES</u>							
601	BROMODICHLOROMETHANE	<0.50		UG/L	RM	10/04/95	
601	BROMOFORM	<0.50		UG/L	RM	10/04/95	
601	BROMOMETHANE	<0.50		UG/L	RM	10/04/95	
601	CARBON TETRACHLORIDE	<0.50		UG/L	RM	10/04/95	
601	CHLOROBENZENE	<0.50		UG/L	RM	10/04/95	
601	CHLOROETHANE	<0.50		UG/L	RM	10/04/95	
601	CHLOROFORM	<0.50		UG/L	RM	10/04/95	
601	CHLOROMETHANE	<0.50		UG/L	RM	10/04/95	
601	2-CHLOROETHYL VINYL ETHER	<1.5		UG/L	RM	10/04/95	
601	DIBROMOCHLOROMETHANE	<0.50		UG/L	RM	10/04/95	
601	1,2-DICHLOROBENZENE	<0.50		UG/L	RM	10/04/95	
601	1,3-DICHLOROBENZENE	<0.50		UG/L	RM	10/04/95	
601	1,4-DICHLOROBENZENE	<0.50		UG/L	RM	10/04/95	
601	DICHLORODIFLUOROMETHANE	<0.50		UG/L	RM	10/04/95	
601	1,1-DICHLOROETHANE	<0.50		UG/L	RM	10/04/95	
601	1,2-DICHLOROETHANE	<0.50		UG/L	RM	10/04/95	
601	1,1-DICHLOROETHENE	<0.50		UG/L	RM	10/04/95	
601	trans-1,2-DICHLOROETHENE	<0.50		UG/L	RM	10/04/95	
601	1,2-DICHLOROPROPANE	<0.50		UG/L	RM	10/04/95	
601	cis-1,3-DICHLOROPROPENE	<0.50		UG/L	RM	10/04/95	
601	trans-1,3-DICHLOROPROPENE	<0.50		UG/L	RM	10/04/95	
601	METHYLENE CHLORIDE	<0.50		UG/L	RM	10/04/95	
601	1,1,2,2-TETRACHLOROETHANE	<0.50		UG/L	RM	10/04/95	
601	TETRACHLOROETHENE	<0.50		UG/L	RM	10/04/95	

OMEGA ENVIRONMENTAL SERVICES  
4661 HAMMERMILL ROAD, SUITE B  
TUCKER, GA 30084  
Attn: M. DOUG DRIVER



ANALYTICAL REPORT

Page 3

Submission Number: 9509000339      Client's P.O. Number:  
Date Received: 09/29/95      Project Number: 95012  
Date Reported: 10/10/95      Project Name: KEY WEST NAS

Lab Sample Number: 9339 23      Date Sampled: 09/28/95  
Client Sample Number: A902B      Sample Matrix: GROUND WATER  
Sample Description: GROUND WATER

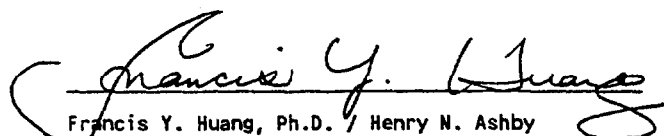
Method	Analyte	Result	Q	Unit	Analyst	Date Analyzed	Date Prepared
<u>GAG AND KAG HALOGENATED VOLATILES</u>							
601	1,1,1-TRICHLOROETHANE	<0.50		UG/L	RM	10/04/95	
601	1,1,2-TRICHLOROETHANE	<0.50		UG/L	RM	10/04/95	
601	TRICHLOROETHENE	<0.50		UG/L	RM	10/04/95	
601	TRICHLOROFLUOROMETHANE	<0.50		UG/L	RM	10/04/95	
601	VINYL CHLORIDE	<0.50		UG/L	RM	10/04/95	

Data Qualifier Code Key:

D - Sample Was Diluted And Result Corrected With Dilution Factor.

CERTIFICATION: All analytical data reported above were obtained using the specified methods and were validated by our laboratory quality control system. This laboratory follows an approved quality assurance program.

Respectfully submitted:

  
Francis Y. Huang, Ph.D. / Henry N. Ashby  
Lab Director / President



Envirolab  
P. O. Box 468 • 8 East Tower Circle  
Ormond Beach, Florida 32175 - 0468  
904/672 - 5668 • FAX 904/673 - 4001

# CHAIN OF CUSTODY RECORD

No.E 05433

Page \_\_\_\_ of \_\_\_\_

(INSTRUCTIONS ON BACK)

## FOR LAB USE ONLY

Temp. of Contents: \_\_\_\_\_ ° C (or ROI)

Condition of Contents: See Back

Condition of Seals: OK

## FOR LAB USE ONLY

Submission No.

9509-339

1. Client: (Company & individual)

OMEGA ENVIR. SVS.

Address: 4661 Hammermill Rd.

Phone: 407-621-9411

City Tucker State GA Zip Code 30084

Fax: ( )

2. Report to: (If different from above)

Address:

Phone: ( )

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Fax: ( )

## FOR LAB USE ONLY

Profile No.:

551

Quote No.:

3. Client Project Name:

Key West NAS

4. Client Project No:

95012

5. P. O. No.:

6. Custody Seal No.:

7. Sampled by:

Michael Warren

## WATER SAMPLE CODES (FOR ITEM 13):

DW = drinking water  
GW = ground water  
PW = process water  
SW = surface water  
WW = waste water  
O = other

## CONTAINER TYPES (FOR ITEM 15):

V = VOA vial  
G = glass  
P = plastic  
O = other

## 8. SHIPPING METHOD:

☒ UPS  
☐ FEDEX  
☐ Hand Carried  
☐ Other

15. Container Type:

14.

No. of Containers

Analyses Requested

17. Report Type

☒ Routine  
☐ With QC  
☐ Special Forms

18. Turnaround Time

☒ Standard  
☐ Rush: \_\_\_\_/\_\_\_\_/\_\_\_\_

ITEM	9. SAMPLE I. D. (NO.)	10. SAMPLE DESCRIPTION	11. DATE	TIME	12. Comp. Grab	13. Water (code)	Soil	Sludge	Other	14. No. of Containers	15. Container Type	16. Analyses Requested	17. Report Type	18. Turnaround Time	19. REMARK	LAB USE ONLY LAB. SAMPLE NO.
①	A902B	Ground Water	9-28	10:30		GW				1	GAG					9339-1
②	A902B	Ground Water	9-28	10:30		GW				1	GAG					
③	A902B	Ground Water	9-28	10:30		GW				2	GAG					
④	A902B	Ground Water	9-28	10:30		GW				2	GAG				There was air in	
⑤	A902B	Ground Water	9-28	10:30		GW				1	GAG				nials + COC said	
⑥															GAG not KAG.	
⑦															John Meant stated	
⑧															run with air +	
⑨															KAG. Shila W	
⑩															9-29-95	

20. RELINQUISHED BY

DATE

TIME

21. RECEIVED BY

DATE

TIME

## LAB USE ONLY

SAMPLING FEE: \_\_\_\_\_ HRS.

SAMPLE RECEIVING NOTE:

① Michael Warren

28 Sept  
3:20

3:20 PM

Sandy Burton

9-28-95

②

D. Behest

9-29-95

③

K. Howard

1000

**APPENDIX 5**

## **Certificate of Disposal**

Omega Environmental Services Inc. certifies that the following listed items have been disposed of in the described manner and all supporting data is accurate and complete. The listed items were disposed of as specified in API 1604 in accordance with Section 17-761.800 F.A.C.

### **Item Description**

Tank A902B  
1000 Gallon Steel Tank Building 902.  
Key West, NAS, Florida

### **Disposal Method**

Tank was Cleaned and disassembled for Disposal at  
Atlas Iron Processors Inc.  
Miami, Florida

### **Disposal Date**

September, 29 1995

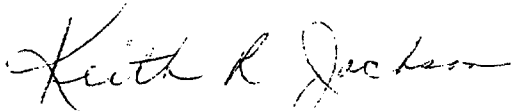
### **Contract Information**

Remove Underground Storage Tanks  
Key West, NAS, Florida  
Contract No. N62467-93-C-0645  
Department of The Navy

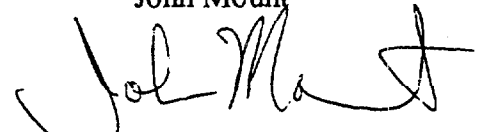
We Certify that the above information is accurate and complete.

Omega Environmental Services Representatives

Keith Jackson

  
President

John Mount

  
Project Supervisor

**Omega Environmental Services**  
**Manifest Shipping Log**  
**Tank A902B**

Date	Shipper	Tank #	Manifest #	Quantity	Units
26-Sep-95	EMC	A902B	30116	215	Gallons

Totals

215 Gallons

(305) 477-7497

EMC Oil Corporation  
P.O. Box 520882 - Miami, FL 33152

(800) 344-8688

**UNIFORM WASTE TRANSPORTERS MANIFEST**  
NO HAZARDOUS MIXTURES ACCEPTED - READ BOTTOM OF MANIFEST

1. Generator's Name and Mailing Address <b>US NAVY BASE Boca Raton Hwy West FL 33086</b>		A. Manifest Document # <b>No 030116</b>	
2. Generator's Phone <b>(305) 296-5700</b> County of Origin <b>MONROE</b>		B. Generator's ID # EPA _____ STATE _____	
3. Transporter 1 Company Name <b>EMC</b> <b>EMC Oil Corporation</b> <b>8470 N.W. 68th Street, Miami, FL 33166</b>		4. US EPA ID Number <b>FLR000000166</b>	
5. Designated Facility Name and Site Address		6. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	
7. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)		8. Containers No. Type	
9. Total Quantity		10. Unit Wt. Vol	
G. CHARGES			
a. Oil NOS - Combustible Liquid NA 1270		893	
b. Used Oil Filters			
c. Wet Petro Dust For Recy Oily Water / Sludge		215	
d. CONTRACTED BY OMEGA Other: Specify ENVIRONMENTAL.			
H. Additional Descriptions for Materials Listed Above		I. Total Due.	
IMPORTANT: Payment due upon receipt of invoice. A service charge of 1 1/2% (18% per annum) will be charged on over 30 days past due balance. In the event it shall become necessary to collect the herein above sums or any part thereof, the purchaser agrees to pay all the replaceable cost thereof.		Please pay on this invoice within 15 days. Thank you	
11. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.			
I also confirm that the contents of this consignment contains no hazardous materials.			
Printed Typed Name <b>Michael Warren</b>		Signature <b>Michael Warren</b>	
Month Day Year <b>09/26/95</b>			
12. Transporter 1 Acknowledgment of Receipt of Materials			
Printed Typed Name <b>George L. Vincent</b>		Signature <b>George L. Vincent</b>	
Month Day Year <b>09/26/95</b>			
13. Facility Owner or Operator: Certification of receipt of waste material covered by this manifest.			
Printed Typed Name		Signature	
Month Day Year			

Broward County #'s 532 ☐ 533 ☐ 534 ☐ 535 ☐ 536 ☐ 537 ☐

Dear Generator: The following chemicals contain hazardous substances which when mixed with used oil reduces the recycling potential and can cause harmful effects to the environment.

DO NOT MIX WITH USED OIL  
Antifreeze - Freon - Solvents - Thinner - Degreasers - Detergents - Cleaners - Radiator Fluid - Leaded Gasoline - Cutting Oil

CAN MIX WITH USED OIL  
Motor Oils - Diesel Fuel - Grease - Brake Fluids - Hydraulic Fluids - Transmission Fluids

These lists are based on current information and may be expanded as more data becomes available. THANK YOU.

WHITE - Generator GREEN - Generator YELLOW - Transporter PINK - Transporter GOLDENROD - Transfer Station

**APPENDIX 6**



4 FEBRUARY 1991

## NAS KEY WEST UNDERGROUND EXCAVATION PERMIT

## PART I (Complete by requestor)

From: ROICC OFFICE Date: JULY 10, 95  
 To: Public Works Officer, NAS. Key West Applicant's Request No. 7

It is requested that a permit be issued for performing the work required by:

1. CONTRACT # 93-0645 REMOVE UNDER GROUND TANKS OMEGA ENU.  
 (Reference contract, drawing, specifications, service call, etc. (include prime contractor or A/E identification.)

2. EXCAVATION 3. \_\_\_\_\_  
 (Type: drill, dredge, trench, etc.) (Charge to job order, etc.)

4. Physical limits: FUEL FARM FILL STATION - SEE SITE PLAN  
ENCLOSED.

5. Remarks: TANK PRESENTLY IN-USE  
 (Includes results of any investigation not performed by PWD.)

[Signature]  
 Signature & Title

## PART II (Completed by PWD) (Strike out non-applicable portions.)

From: P.W. ENGINEERING To: POICC Date: 7/19/95

The work delineated above may be undertaken pursuant to the following stipulations:

a. No contractual or other obligations are changed by this permit. Responsibility for damages are not changed by this permit.

b. PWD has examined the work by:  
 Visual inspection in the field ✓ Field survey \_\_\_\_\_  
 Examination of existing plans ✓ Other \_\_\_\_\_  
 Investigation with magnetic pipe locator, etc. ✓

Unknown subsurface conditions may exist which cannot be located by any of these standard procedures.

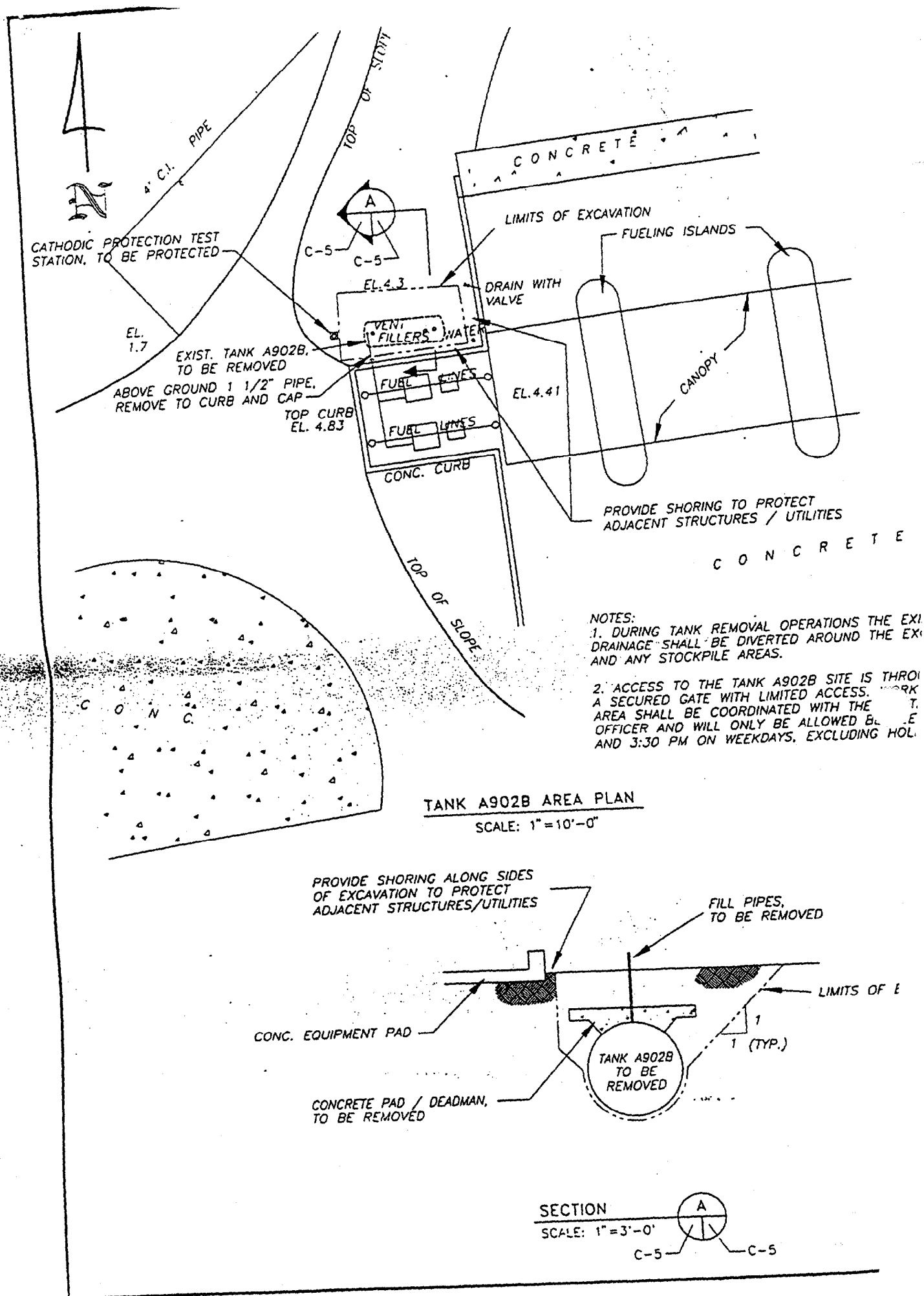
c. Southern Bell Telephone Company must be contacted by requestor prior to digging.

d. The PWD survey indicates that your planned procedure will probably not conflict with existing facilities. You are, therefore, granted permission to perform the work.

e. The PWD investigation indicates: OK TO EXCAVATE AS INDICATED

PERMIT NO. 255

[Signature]  
 Signature & Title  
 Engineering Division



**APPENDIX 7**

No Photographs Available

Air Force Restricted Area



STATE OF FLORIDA  
DEPARTMENT OF HEALTH AND REHABILITATIVE SERVICES

"COMMITTED TO EXCELLENCE"

Working in partnership with local communities to help people be self-sufficient, experience good health and live in stable families and communities.

July 3, 1996

Jim Simmen  
Naval Air Station  
Public Works Code 1883  
P. O. Box 9007  
Key West, FL 33040-9001

Re: Monroe County - TK  
CCL/96-101  
Facility ID# 449400050  
Truck Fill Stand

Dear Mr. Simmen:

This office received a report dated October 25, 1996, regarding the petroleum storage tank closure at the referenced facility. It was reviewed to determine compliance with the State Storage Tank Rules (Chapter 62-761 FAC for underground tanks and 62-762 FAC for aboveground tanks) and guidelines. The report **does not** meet the requirements of the Department of Environmental Protection for a Closure Assessment Report. The review revealed:

1. a DRF was not filed with this office.
2. contaminated soils were returned to the pit.
3. free product was not recovered.

To bring this report into compliance:

1. send a DRF for this discovery.
2. remove and properly dispose of contaminated soils.
3. remove free product exposed in the pit.

Correct the items listed above within 30 days of receipt of this letter. Send documents or copies to my attention at the letterhead address of the Key West office. Another review will be conducted to verify that these items have been completed.

Call John Carter at 305/292-6894 if you have any questions or write to the Key West office.

MONROE COUNTY PUBLIC HEALTH UNIT

P.O. Box 6193 • Key West, FL 33041-6193 • (305) 292-6894 Fax # 292-6872  
7999 Overseas Highway • Marathon, FL 33050 • (305) 289-2450 Fax # (305) 289-2479  
P.O. Box 157 • Tavernier, FL 33070 • (305) 853-3240 Fax # (305) 853-3242

LAWTON CHILES, GOVERNOR

Respectfully,

A handwritten signature in cursive script, appearing to read "John Carter".

John Carter  
Environmental Specialist

CC:  
C. H. Moss, PE  
Omega Environmental Services, Inc.  
4661 Hammermill Road, Suite B  
Tucker, GA 30084



DEPARTMENT OF THE NAVY

NAVAL AIR STATION

PO BOX 9001

KEY WEST FL 33040-9001

5090

Ser 1883JS/1378

3 Oct 96

John Carter  
State of Florida  
Department of Health and  
Rehabilitative Services  
PO Box 6193  
Key West, FL 33041-6193

Dear Mr. Carter:

On 3 July, 1996, you reviewed a closure report for the underground storage tank A-902B, submitted to you in September, 1995. Several discrepancies were found that needed correcting. The inspection revealed:

1. A DRF was not filed with this office.
2. Contaminated soils were returned to the pit.
3. Free product was not recovered.

Corrections made since the 3 July 1996 letter:

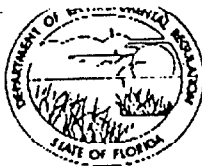
1. A DRF was filed with your office on 30 July 1996.
2. On 28 August, 1996, three dump truck loads of contaminated soil was removed from the tank location (approximately 24 cubic yards). The dirt was removed from a twelve foot diameter. The dirt was contaminated all the way down to the water table.
3. No free product was visible on the water table.

Should you have any questions or require further information on any of these items, please contact our Tank Program Manager, Mr. Jim Simmen, at 293-2881.

Sincerely,

R. A. DEMES  
Engineering Director  
Public Works Department  
By direction of  
the Commanding Officer

Copy to:  
FDEP, Marathon (Lisa Gordon)



# Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

DER Form #	17-761.800(1)
Form Title	Discharge Reporting Form
Effective Date	December 10, 1990
DER Application No.	(Filed In by DER)

## Discharge Reporting Form

Use this form to notify the Department of Environmental Regulation of:

1. Results of tank tightness testing that exceed allowable tolerances within ten days of receipt of test result.
2. Petroleum discharges exceeding 25 gallons on pervious surfaces as described in Section 17-761.460 F.A.C. within one working day of discovery.
3. Hazardous substance (CERCLA regulated), discharges exceeding applicable reportable quantities established in 17-761.460(2) F.A.C., within one working day of the discovery.
4. Within one working day of discovery of suspected releases confirmed by: (a) released regulated substances or pollutants discovered in the surrounding area, (b) unusual and unexplained storage system operating conditions, (c) monitoring results from a leak detection method or from a tank closure assessment that indicate a release may have occurred, or (d) manual tank gauging results for tanks of 550 gallons or less, exceeding ten gallons per weekly test or five gallons averaged over four consecutive weekly tests.

Mail to the DER District Office in your area listed on the reverse side of this form

PLEASE PRINT OR TYPE  
Complete all applicable blanks

1. DER Facility ID Number: 449400050 2. Tank Number: A 935 3. Date: July 30, 1996
4. Facility Name: NAVAL AIR STATION KEY WEST  
Facility Owner or Operator: Commanding OFFICER  
Facility Address: NAVAL AIR STATION (code 1883, Key West, FL 33040)  
Telephone Number: (305) 293-2881 County: \_\_\_\_\_  
Mailing Address: Commanding OFFICER NAVAL AIR STATION (code 1883)  
10/26/95 Key West, FL - 33040 - 5000
5. Date of receipt of test results or discovery: \_\_\_\_\_ month/day/year
6. Method of initial discovery. (circle one only)  
A. Liquid detector (automatic or manual) B. Vapor detector (automatic or manual) C. Tightness test (underground tanks only).  
D. Emptying and Inspection. E. Inventory control. F. Vapor or visible signs of a discharge in the vicinity.  
G. Closure: \_\_\_\_\_ (explain) H. Other: \_\_\_\_\_
7. Estimated number of gallons discharged: UNKNOWN
8. What part of storage system has leaked? (circle all that apply) A. Dispenser B. Pipe C. Fitting D. Tank E. Unknown
9. Type of regulated substance discharged. (circle one)  
A. leaded gasoline B. unleaded gasoline C. gasohol D. vehicular diesel F. aviation gas E. jet fuel  
L. used/waste oil M. diesel O. new/lube oil V. hazardous substance includes pesticides, ammonia, chlorine and derivatives (write in name or Chemical Abstract Service CAS number) \_\_\_\_\_  
Z. other (write in name) \_\_\_\_\_
10. Cause of leak. (circle all that apply)  
A. Unknown B. Split C. Loose connection D. Corrosion E. Puncture F. Installation failure G. Spill H. Overfill I. Other (specify) upon removal, the tank was sound.
11. Type of financial responsibility. (circle one)  
A. Third party insurance provided by the state insurance contractor B. Self-insurance pursuant to Chapter 17-769.500 F.A.C. C. Not applicable D. None
12. To the best of my knowledge and belief all information submitted on this form is true, accurate, and complete.

James M. Simmen TANK PROCLAIM Mgr.  
Printed Name of Owner, Operator or Authorized Representative

James M. Simmen July 30, 1996  
Signature of Owner, Operator or Authorized Representative

Northwest District  
180 Governmental Center  
Pensacola, Florida 32501-8794  
904-436-8300

Northeast District  
7825 Baymeadows Way, Suite 8 200  
Jacksonville, Florida 32207  
904-788-4200

Central District  
3318 Maguire Blvd, Suite 232  
Orlando, Florida 32803 3767  
407-894-7555

Southwest District  
4520 Oak Park Blvd.  
Tampa, Florida 33616-7347  
813-623-5581

South District  
2380 Bay St.  
Fort Myers, Florida 33901-2898  
813-337-8978

Southeast District  
1800 B. Congress Ave., Suite A  
West Palm Beach, Florida 33408  
407-433-7850



## **APPENDIX C**

### **IDW MANIFESTS**



(732) 462-1001 • FAX (732) 308-0924

175 BARTOW MUN. AIRPORT  
BARTOW, FL 33830  
PHONE: (941) 533-4599  
FAX: (941) 533-1613108 MONAHAN AVENUE  
DUNMORE, PA 18512  
PHONE: (717) 342-7232  
FAX: (717) 342-7367350 PIGEON POINT ROAD  
NEW CASTLE, DE 19720  
PHONE: (302) 658-2005  
FAX: (302) 658-6229156 DRIFTWOOD DRIVE  
EUTAWVILLE, SC 29048  
PHONE/FAX: (803) 492-9595**MANIFEST**

FCI EPA ID NO.:

NJD054126164

**I 87989**

GENERATOR NAME/ADDRESS <b>N.A.S. (Boca Chica) Key West, FL 33040</b>		PHONE <b>305 293-2583</b> (AREA CODE)		GENERATOR EPA ID NO. <b>116170022752</b>	
FCI REP. LOADING (PRINT) <b>Trawick</b>		PROCEDURE <b>PL</b>	BOX SPOTTED	BOX REMOVED	APPOINTMENT TIME <b>As: 1P</b>
COMMENTS OR DELAYS AT GENERATOR				EQUIPMENT USED	

BROKER: <b>FCC</b>		STATE MANIFEST NO.: <b>750071791</b>								
PO#:	WO#:									
(X) NM	PROPER U.S. D.O.T. SHIPPING NAME	U.S. D.O.T. HAZARDOUS CLASS	NA/UN/NO.	PACKING GROUP	NO. CONT.	CONT. TYPE	NET QUANTITY	UNIT MEASURE	WASTE NO.	FORM
1	<b>See Manifest</b>	<b>1071791</b>			<b>17</b>	<b>UN</b>	<b>(553)</b>			
2										
3										

SPECIAL HANDLING INSTRUCTIONS INCLUDING CONTAINER EXEMPTION (I.E., IDENTIFICATION SHIPMENT OF A NON-HAZARDOUS NATURE WHICH DOES NOT HAVE TO BE MANIFESTED).

GENERATOR'S CERTIFICATION: This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation, U.S. EPA and the State. The wastes described above were consigned to the Transported named. The Treatment, Storage or Disposal Facility can and will accept the shipment of hazardous waste, and has a valid permit to do so. I certify that the foregoing is true and correct to the best of knowledge.

Payment to the contractor for waste removal does not constitute payment to the carrier and if the contractor does not pay the carrier, the generator is obligated to pay the agreed rate offered to the contractor.

PLEASE PRINT NAME/TITLE	GENERATOR'S SIGNATURE <b>X Patricia A. McKelvey</b>	DATE LOADED <b>12/2/95</b> MO. DAY YR.
-------------------------	--	--

TSDF NAME/ADDRESS <b>Fisher</b> <b>116170022752</b>		PHONE <b>356 492-8340</b> (AREA CODE)		TSDF EPA ID NO. <b>116170022752</b>	
FCI REP. UNLOADING (PRINT)		PROCEDURE	BOX SPOTTED	BOX REMOVED	APPOINTMENT TIME
COMMENTS OR DELAYS AT TSDF		EQUIPMENT USED			
PLEASE PRINT NAME/TITLE	TSDF SIGNATURE <b>X</b>			DATE UNLOADED <b>12/2/95</b> MO. DAY YR.	

AR H-0257  
PC 944  
CT CT-HW-307  
DE DE-HW-203  
DE-SW-203  
IL SWH-1540ME ME-HWT-47  
ME-WOT-47  
MD HWH-167  
96-OP-1765  
MA MA-294  
MN 61572MO H-1490  
ND WH-429  
NH TNH-0047  
NJ S-2265  
15939  
NY JA-113NOVA SCOTIA, CANADA NSC 000 147  
OH 333-HW  
OK 3358  
ONTARIO, CANADA A 840943  
PA PA-AH-0067QUEBEC, CANADA QC-6ML-047  
RI RI-535  
TX 40705  
WI 11602te - FCI Original  
Yellow - FCI Billing  
Blue - FCI Office/Customer  
Green - Retained by TSDF  
Gold - Retained by Generator**I 87989**

## HAZARDOUS WASTE MANIFEST

(AS REQUIRED BY THE ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT)

Please print or type

(Form designed for use on elite (12-pitch) typewriter.)

FISHER INDUSTRIAL SERVICE, INC.

A Member of The North American Group Ltd.

Form Approved. OMB No. 2050-0039. Expires 9-30-92

UNIFORM HAZARDOUS  
WASTE MANIFEST

Generator's US EPA ID No.

Manifest  
Document No. 1-2-8-0-4  
Page 1 of 1Information in the shaded areas is not  
required by Federal law.

3. Generator's Name and Mailing Address

NAVAL AIR STATION - BLDG 1902

A. State Manifest Document Number

FIS 0071791

4. Generator's Phone (954)

KEY WEST, FL. COMMUNICATING OFFICER, NAS  
33040-9001

B. State Generator's ID

5. Transporter 1 Company Name

FREEHOLD CARTAGE, INC.

6. US EPA ID Number

NJ D 0 5 4 1 2 6 1 6 4

C. State Transporter's ID

D. Transporter's Phone 800/771-1050

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address

Fisher Industrial Service, Inc.  
402 Webster Chapel Rd.  
Glencoe, AL 35905

10. US EPA ID Number

AL D 9 8 1 0 2 0 8 9 4

G. State Facility's ID

ALD981020894

H. Facility's Phone

(256) 492-8340

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)

12. Containers

13. Total

14. Unit

I. Waste No.

a. NON HAZARDOUS MATERIAL (PETROLEUM SOIL),  
(Contains PETROLEUM SOIL) NA

FIS Profile #: 3 9 1 8 5 00.5 D M 00.275 G

b. NON REGULATED MATERIAL (PETROLEUM WATER),  
(Contains PETROLEUM CONTAMINATED WATER) NA

FIS Profile #: 3 9 1 8 6 01.4 D M 00.770 G

c. FIS Profile #:

d. FIS Profile #:

J. Additional Descriptions for Materials Listed Above

Transporter has E.R.G. Book.

K. Handling Codes for Wastes Listed Above

501/MI41

FLORIDA

State of Origin:

15. Special Handling Instructions and Additional Information

TECHNICAL CONTACT:

FLORIDA ENVIRONMENTAL COMPLIANCE CORP  
800/771-1050

24 Hr. Emergency Response Name/Number:

RICK OFSANKO

(954) 570-5885

CUSTOMER NO. 1646

Work Order #:

Purchase Order #:

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name

Signature

Month Day Year

Patricia A. McNeill

Patricia A. McNeill

12 03 98

17. Transporter 1 Acknowledgment of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

Joseph M. Trawick

Joseph M. Trawick

12 03 98

18. Transporter 2 Acknowledgment of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year

**APPENDIX D**

**SOIL BORING LOGS**

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-SB01	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/23/98	<b>LOGGED BY:</b> P. Calligan
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO</b> ∇ 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
4			120	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
5			48					
10								
15								

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CT0-0031 / N7586
<b>BORING ID:</b> A902-SB02	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/23/98	<b>LOGGED BY:</b> P. Calligan
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO</b> ∇ 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
1120				LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
310								
5								
10								
15								

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CT0-0031 / N7586
<b>BORING ID:</b> A902-SB03	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/23/98	<b>LOGGED BY:</b> P. Calligan
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO ∇</b> 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
4			280	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044 1045 1046 1047 1048 1049 1050 1051 1052 1053 1054 1055 1056 1057 1058 1059 1060 1061 1062 1063 1064 1065 1066 1067 1068 1069 1070 1071 1072 1073 1074 1075 1076 1077 1078 1079 1080 1081 1082 1083 1084 1085 1086 1087 1088 1089 1090 1091 1092 1093 1094 1095 1096 1097 1098 1099 1100 1101 1102 1103 1104 1105 1106 1107 1108 1109 1110 1111 1112 1113 1114 1115 1116 1117 1118 1119 1120 1121 1122 1123 1124 1125 1126 1127 1128 1129 1130 1131 1132 1133 1134 1135 1136 1137 1138 1139 1140 1141 1142 1143 1144 1145 1146 1147 1148 1149 1150 1151 1152 1153 1154 1155 1156 1157 1158 1159 1160 1161 1162 1163 1164 1165 1166 1167 1168 1169 1170 1171 1172 1173 1174 1175 1176 1177 1178 1179 1180 1181 1182 1183 1184 1185 1186 1187 1188 1189 1190 1191 1192 1193 1194 1195 1196 1197 1198 1199 1200 1201 1202 1203 1204 1205 1206 1207 1208 1209 1210 1211 1212 1213 1214 1215 1216 1217 1218 1219 1220 1221 1222 1223 1224 1225 1226 1227 1228 1229 1230 1231 1232 1233 1234 1235 1236 1237 1238 1239 1240 1241 1242 1243 1244 1245 1246 1247 1248 1249 1250 1251 1252 1253 1254 1255 1256 1257 1258 1259 1260 1261 1262 1263 1264 1265 1266 1267 1268 1269 1270 1271 1272 1273 1274 1275 1276 1277 1278 1279 1280 1281 1282 1283 1284 1285 1286 1287 1288 1289 1290 1291 1292 1293 1294 1295 1296 1297 1298 1299 1300 1301 1302 1303 1304 1305 1306 1307 1308 1309 1310 1311 1312 1313 1314 1315 1316 1317 1318 1319 1320 1321 1322 1323 1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339 1340 1341 1342 1343 1344 1345 1346 1347 1348 1349 1350 1351 1352 1353 1354 1355 1356 1357 1358 1359 1360 1361 1362 1363 1364 1365 1366 1367 1368 1369 1370 1371 1372 1373 1374 1375 1376 1377 1378 1379 1380 1381 1382 1383 1384 1385 1386 1387 1388 1389 1390 1391 1392 1393 1394 1395 1396 1397 1398 1399 1400 1401 1402 1403 1404 1405 1406 1407 1408 1409 1410 1411 1412 1413 1414 1415 1416 1417 1418 1419 1420 1421 1422 1423 1424 1425 1426 1427 1428 1429 1430 1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443 1444 1445 1446 1447 1448 1449 1450 1451 1452 1453 1454 1455 1456 1457 1458 1459 1460 1461 1462 1463 1464 1465 1466 1467 1468 1469 1470 1471 1472 1473 1474 1475 1476 1477 1478 1479 1480 1481 1482 1483 1484 1485 1486 1487 1488 1489 1490 1491 1492 1493 1494 1495 1496 1497 1498 1499 1500 1501 1502 1503 1504 1505 1506 1507 1508 1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1520 1521 1522 1523 1524 1525 1526 1527 1528 1529 1530 1531 1532 1533 1534 1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1545 1546 1547 1548 1549 1550 1551 1552 1553 1554 1555 1556 1557 1558 1559 1560 1561 1562 1563 1564 1565 1566 1567 1568 1569 1570 1571 1572 1573 1574 1575 1576 1577 1578 1579 1580 1581 1582 1583 1584 1585 1586 1587 1588 1589 1590 1591 1592 1593 1594 1595 1596 1597 1598 1599 1600 1601 1602 1603 1604 1605 1606 1607 1608 1609 1610 1611 1612 1613 1614 1615 1616 1617 1618 1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630 1631 1632 1633 1634 1635 1636 1637 1638 1639 1640 1641 1642 1643 1644 1645 1646 1647 1648 1649 1650 1651 1652 1653 1654 1655 1656 1657 1658 1659 1660 1661 1662 1663 1664 1665 1666 1667 1668 1669 1670 1671 1672 1673 1674 1675 1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1686 1687 1688 1689 1690 1691 1692 1693 1694 1695 1696 1697 1698 1699 1700 1701 1702 1703 1704 1705 1706 1707 1708 1709 1710 1711 1712 1713 1714 1715 1716 1717 1718 1719 1720 1721 1722 1723 1724 1725 1726 1727 1728 1729 1730 1731 1732 1733 1734 1735 1736 1737 1738 1739 1740 1741 1742 1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1755 1756 1757 1758 1759 1760 1761 1762 1763 1764 1765 1766 1767 1768 1769 1770 1771 1772 1773 1774 1775 1776 1777 1778 1779 1780 1781 1782 1783 1784 1785 1786 1787 1788 1789 1790 1791 1792 1793 1794 1795 1796 1797 1798 1799 1800 1801 1802 1803 1804 1805 1806 1807 1808 1809 1810 1811 1812 1813 1814 1815 1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1852 1853 1854 1855			











<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-SB08	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/23/98	<b>LOGGED BY:</b> P. Calligan
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO</b> ∇ 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
100					LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
1500									
5									
10									
15									

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-SB09	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/23/98	<b>LOGGED BY:</b> P. Calligan
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO</b> ∇ 3 ft bls

[illegible]

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-SB10	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/24/98	<b>LOGGED BY:</b> P. Calligan
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO</b> $\nabla$ 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				1580	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044 1045 1046 1047 1048 1049 1050 1051 1052 1053 1054 1055 1056 1057 1058 1059 1060 1061 1062 1063 1064 1065 1066 1067 1068 1069 1070 1071 1072 1073 1074 1075 1076 1077 1078 1079 1080 1081 1082 1083 1084 1085 1086 1087 1088 1089 1090 1091 1092 1093 1094 1095 1096 1097 1098 1099 1100 1101 1102 1103 1104 1105 1106 1107 1108 1109 1110 1111 1112 1113 1114 1115 1116 1117 1118 1119 1120 1121 1122 1123 1124 1125 1126 1127 1128 1129 1130 1131 1132 1133 1134 1135 1136 1137 1138 1139 1140 1141 1142 1143 1144 1145 1146 1147 1148 1149 1150 1151 1152 1153 1154 1155 1156 1157 1158 1159 1160 1161 1162 1163 1164 1165 1166 1167 1168 1169 1170 1171 1172 1173 1174 1175 1176 1177 1178 1179 1180 1181 1182 1183 1184 1185 1186 1187 1188 1189 1190 1191 1192 1193 1194 1195 1196 1197 1198 1199 1200 1201 1202 1203 1204 1205 1206 1207 1208 1209 1210 1211 1212 1213 1214 1215 1216 1217 1218 1219 1220 1221 1222 1223 1224 1225 1226 1227 1228 1229 1230 1231 1232 1233 1234 1235 1236 1237 1238 1239 1240 1241 1242 1243 1244 1245 1246 1247 1248 1249 1250 1251 1252 1253 1254 1255 1256 1257 1258 1259 1260 1261 1262 1263 1264 1265 1266 1267 1268 1269 1270 1271 1272 1273 1274 1275 1276 1277 1278 1279 1280 1281 1282 1283 1284 1285 1286 1287 1288 1289 1290 1291 1292 1293 1294 1295 1296 1297 1298 1299 1300 1301 1302 1303 1304 1305 1306 1307 1308 1309 1310 1311 1312 1313 1314 1315 1316 1317 1318 1319 1320 1321 1322 1323 1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339 1340 1341 1342 1343 1344 1345 1346 1347 1348 1349 1350 1351 1352 1353 1354 1355 1356 1357 1358 1359 1360 1361 1362 1363 1364 1365 1366 1367 1368 1369 1370 1371 1372 1373 1374 1375 1376 1377 1378 1379 1380 1381 1382 1383 1384 1385 1386 1387 1388 1389 1390 1391 1392 1393 1394 1395 1396 1397 1398 1399 1400 1401 1402 1403 1404 1405 1406 1407 1408 1409 1410 1411 1412 1413 1414 1415 1416 1417 1418 1419 1420 1421 1422 1423 1424 1425 1426 1427 1428 1429 1430 1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443 1444 1445 1446 1447 1448 1449 1450 1451 1452 1453 1454 1455 1456 1457 1458 1459 1460 1461 1462 1463 1464 1465 1466 1467 1468 1469 1470 1471 1472 1473 1474 1475 1476 1477 1478 1479 1480 1481 1482 1483 1484 1485 1486 1487 1488 1489 1490 1491 1492 1493 1494 1495 1496 1497 1498 1499 1500 1501 1502 1503 1504 1505 1506 1507 1508 1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1520 1521 1522 1523 1524 1525 1526 1527 1528 1529 1530 1531 1532 1533 1534 1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1545 1546 1547 1548 1549 1550 1551 1552 1553 1554 1555 1556 1557 1558 1559 1560 1561 1562 1563 1564 1565 1566 1567 1568 1569 1570 1571 1572 1573 1574 1575 1576 1577 1578 1579 1580 1581 1582 1583 1584 1585 1586 1587 1588 1589 1590 1591 1592 1593 1594 1595 1596 1597 1598 1599 1600 1601 1602 1603 1604 1605 1606 1607 1608 1609 1610 1611 1612 1613 1614 1615 1616 1617 1618 1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630 1631 1632 1633 1634 1635 1636 1637 1638 1639 1640 1641 1642 1643 1644 1645 1646 1647 1648 1649 1650 1651 1652 1653 1654 1655 1656 1657 1658 1659 1660 1661 1662 1663 1664 1665 1666 1667 1668 1669 1670 1671 1672 1673 1674 1675 1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1686 1687 1688 1689 1690 1691 1692 1693 1694 1695 1696 1697 1698 1699 1700 1701 1702 1703 1704 1705 1706 1707 1708 1709 1710 1711 1712 1713 1714 1715 1716 1717 1718 1719 1720 1721 1722 1723 1724 1725 1726 1727 1728 1729 1730 1731 1732 1733 1734 1735 1736 1737 1738 1739 1740 1741 1742 1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1755 1756 1757 1758 1759 1760 1761 1762 1763 1764 1765 1766 1767 1768 1769 1770 1771 1772 1773 1774 1775 1776 1777 1778 1779 1780 1781 1782 1783 1784 1785 1786 1787 1788 1789 1790 1791 1792 1793 1794 1795 1796 1797 1798 1799 1800 1801 1802 1803 1804 1805 1806 1807 1808 1809 1810 1811 1812 1813 1814 1815 1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845			



<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CT0-0031 / N7586
<b>BORING ID:</b> A902-SB12	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/24/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO</b> $\nabla$ 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
			3370	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity:				
			NS	Refusal				
5								
10								
15								







<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CT0-0031 / N7586
<b>BORING ID:</b> A902-SB15	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/24/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO</b> ∇ 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
			3	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
∇			2					
5								
10								
15								

BASE: NAS Key West			SITE ID: Truck Fill Stand			PROJECT NO. CT0-0031 / N7586		
BORING ID: A902-SB16			WELL ID:			PIEZOMETER ID:		
CONTRACTOR: Precision Sampling, Inc.			COMPLETION DATE: 06/24/98			LOGGED BY: R. Ofsanko		
METHOD: EnviroCore DPT			DIAMETER: 2.5" OD			TOTAL DEPTH: 6ft bls		
TOC ELEVATION: ft MSL			SCREEN INTERVAL: ft bls			DEPTH TO $\nabla$ 3 ft bls		

DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
			0	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
$\nabla$			1					
5								
10								
15								

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-SB17	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/24/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO ∇</b> 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
15				LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
35								
5								
10								
15								

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-SB18	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/24/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO</b> ∇ 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
			125	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
∇			3375					
5								
10								
15								

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-SB19	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/24/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO</b> ∇ 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				0	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
∇				3390					
5									
10									
15									

BASE: NAS Key West			SITE ID: Truck Fill Stand		PROJECT NO. CTO-0031 / N7586	
BORING ID: A902-SB20			WELL ID:		PIEZOMETER ID:	
CONTRACTOR: Precision Sampling, Inc.			COMPLETION DATE: 06/24/98		LOGGED BY: R. Ofsanko	
METHOD: EnviroCore DPT			DIAMETER: 2.5" OD		TOTAL DEPTH: 6ft bls	
TOC ELEVATION: ft MSL			SCREEN INTERVAL: ft bls		DEPTH TO $\nabla$ 3 ft bls	

DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
			0	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
$\nabla$			17					
5								
10								
15								





<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CT0-0031 / N7586
<b>BORING ID:</b> A902-SB22	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/24/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO</b> ∇ 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
0			0	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
5			1192					
10								
15								

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-SB23	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/25/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO ∇</b> 2 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
∇				0	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
				3					
5									
10									
15									



<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CT0-0031 / N7586
<b>BORING ID:</b> A902-SB25	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/25/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO</b> ∇ 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
5				43	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				





<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-SB28	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/25/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO</b> ∇ 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
∇			2072	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
5			2910					
10								
15								



<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-SB29	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/25/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO</b> ∇ 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
			0	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
4			5					
5								
10								
15								

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CT0-0031 / N7586
<b>BORING ID:</b> A902-SB30	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/25/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO ∇</b> 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
			3060	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
∇			3055					
5								
10								
15								

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-SB31	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/25/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO ∇</b> 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
30			30	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
2955			2955					
5								
10								
15								

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CT0-0031 / N7586
<b>BORING ID:</b> A902-SB32	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/25/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO ∇</b> 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
5			5	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
25			25					
5								
10								
15								

BASE: NAS Key West	SITE ID: Truck Fill Stand	PROJECT NO. CT0-0031 / N7586
BORING ID: A902-SB33	WELL ID:	PIEZOMETER ID:
CONTRACTOR: Precision Sampling, Inc.	COMPLETION DATE: 06/25/98	LOGGED BY: R. Ofsanko
METHOD: EnviroCore DPT	DIAMETER: 2.5" OD	TOTAL DEPTH: 6ft bls
TOC ELEVATION: ft MSL	SCREEN INTERVAL: ft bls	DEPTH TO $\nabla$ 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				0	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.	1 FIRST PASS IN 2ND PASS IN 3RD PASS IN 4TH PASS IN 5TH PASS IN 6TH PASS IN 7TH PASS IN 8TH PASS IN 9TH PASS IN 10TH PASS IN 11TH PASS IN 12TH PASS IN 13TH PASS IN 14TH PASS IN 15TH PASS IN 16TH PASS IN 17TH PASS IN 18TH PASS IN 19TH PASS IN 20TH PASS IN 21ST PASS IN 22ND PASS IN 23RD PASS IN 24TH PASS IN 25TH PASS IN 26TH PASS IN 27TH PASS IN 28TH PASS IN 29TH PASS IN 30TH PASS IN 31ST PASS IN 32ND PASS IN 33RD PASS IN 34TH PASS IN 35TH PASS IN 36TH PASS IN 37TH PASS IN 38TH PASS IN 39TH PASS IN 40TH PASS IN 41ST PASS IN 42ND PASS IN 43RD PASS IN 44TH PASS IN 45TH PASS IN 46TH PASS IN 47TH PASS IN 48TH PASS IN 49TH PASS IN 50TH PASS IN 51ST PASS IN 52ND PASS IN 53RD PASS IN 54TH PASS IN 55TH PASS IN 56TH PASS IN 57TH PASS IN 58TH PASS IN 59TH PASS IN 60TH PASS IN 61ST PASS IN 62ND PASS IN 63RD PASS IN 64TH PASS IN 65TH PASS IN 66TH PASS IN 67TH PASS IN 68TH PASS IN 69TH PASS IN 70TH PASS IN 71ST PASS IN 72ND PASS IN 73RD PASS IN 74TH PASS IN 75TH PASS IN 76TH PASS IN 77TH PASS IN 78TH PASS IN 79TH PASS IN 80TH PASS IN 81ST PASS IN 82ND PASS IN 83RD PASS IN 84TH PASS IN 85TH PASS IN 86TH PASS IN 87TH PASS IN 88TH PASS IN 89TH PASS IN 90TH PASS IN 91ST PASS IN 92ND PASS IN 93RD PASS IN 94TH PASS IN 95TH PASS IN 96TH PASS IN 97TH PASS IN 98TH PASS IN 99TH PASS IN 100TH PASS IN			
4				2880					
5									
10									
15									

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CT0-0031 / N7586
<b>BORING ID:</b> A902-SB34	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/25/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO</b> ∇ 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
4			0	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.	L C S C L C S			

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-SB35	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/25/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO ∇</b> 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				0	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044 1045 1046 1047 1048 1049 1050 1051 1052 1053 1054 1055 1056 1057 1058 1059 1060 1061 1062 1063 1064 1065 1066 1067 1068 1069 1070 1071 1072 1073 1074 1075 1076 1077 1078 1079 1080 1081 1082 1083 1084 1085 1086 1087 1088 1089 1090 1091 1092 1093 1094 1095 1096 1097 1098 1099 1100 1101 1102 1103 1104 1105 1106 1107 1108 1109 1110 1111 1112 1113 1114 1115 1116 1117 1118 1119 1120 1121 1122 1123 1124 1125 1126 1127 1128 1129 1130 1131 1132 1133 1134 1135 1136 1137 1138 1139 1140 1141 1142 1143 1144 1145 1146 1147 1148 1149 1150 1151 1152 1153 1154 1155 1156 1157 1158 1159 1160 1161 1162 1163 1164 1165 1166 1167 1168 1169 1170 1171 1172 1173 1174 1175 1176 1177 1178 1179 1180 1181 1182 1183 1184 1185 1186 1187 1188 1189 1190 1191 1192 1193 1194 1195 1196 1197 1198 1199 1200 1201 1202 1203 1204 1205 1206 1207 1208 1209 1210 1211 1212 1213 1214 1215 1216 1217 1218 1219 1220 1221 1222 1223 1224 1225 1226 1227 1228 1229 1230 1231 1232 1233 1234 1235 1236 1237 1238 1239 1240 1241 1242 1243 1244 1245 1246 1247 1248 1249 1250 1251 1252 1253 1254 1255 1256 1257 1258 1259 1260 1261 1262 1263 1264 1265 1266 1267 1268 1269 1270 1271 1272 1273 1274 1275 1276 1277 1278 1279 1280 1281 1282 1283 1284 1285 1286 1287 1288 1289 1290 1291 1292 1293 1294 1295 1296 1297 1298 1299 1300 1301 1302 1303 1304 1305 1306 1307 1308 1309 1310 1311 1312 1313 1314 1315 1316 1317 1318 1319 1320 1321 1322 1323 1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339 1340 1341 1342 1343 1344 1345 1346 1347 1348 1349 1350 1351 1352 1353 1354 1355 1356 1357 1358 1359 1360 1361 1362 1363 1364 1365 1366 1367 1368 1369 1370 1371 1372 1373 1374 1375 1376 1377 1378 1379 1380 1381 1382 1383 1384 1385 1386 1387 1388 1389 1390 1391 1392 1393 1394 1395 1396 1397 1398 1399 1400 1401 1402 1403 1404 1405 1406 1407 1408 1409 1410 1411 1412 1413 1414 1415 1416 1417 1418 1419 1420 1421 1422 1423 1424 1425 1426 1427 1428 1429 1430 1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443 1444 1445 1446 1447 1448 1449 1450 1451 1452 1453 1454 1455 1456 1457 1458 1459 1460 1461 1462 1463 1464 1465 1466 1467 1468 1469 1470 1471 1472 1473 1474 1475 1476 1477 1478 1479 1480 1481 1482 1483 1484 1485 1486 1487 1488 1489 1490 1491 1492 1493 1494 1495 1496 1497 1498 1499 1500 1501 1502 1503 1504 1505 1506 1507 1508 1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1520 1521 1522 1523 1524 1525 1526 1527 1528 1529 1530 1531 1532 1533 1534 1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1545 1546 1547 1548 1549 1550 1551 1552 1553 1554 1555 1556 1557 1558 1559 1560 1561 1562 1563 1564 1565 1566 1567 1568 1569 1570 1571 1572 1573 1574 1575 1576 1577 1578 1579 1580 1581 1582 1583 1584 1585 1586 1587 1588 1589 1590 1591 1592 1593 1594 1595 1596 1597 1598 1599 1600 1601 1602 1603 1604 1605 1606 1607 1608 1609 1610 1611 1612 1613 1614 1615 1616 1617 1618 1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630 1631 1632 1633 1634 1635 1636 1637 1638 1639 1640 1641 1642 1643 1644 1645 1646 1647 1648 1649 1650 1651 1652 1653 1654 1655 1656 1657 1658 1659 1660 1661 1662 1663 1664 1665 1666 1667 1668 1669 1670 1671 1672 1673 1674 1675 1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1686 1687 1688 1689 1690 1691 1692 1693 1694 1695 1696 1697 1698 1699 1700 1701 1702 1703 1704 1705 1706 1707 1708 1709 1710 1711 1712 1713 1714 1715 1716 1717 1718 1719 1720 1721 1722 1723 1724 1725 1726 1727 1728 1729 1730 1731 1732 1733 1734 1735 1736 1737 1738 1739 1740 1741 1742 1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1755 1756 1757 1758 1759 1760 1761 1762 1763 1764 1765 1766 1767 1768 1769 1770 1771 1772 1773 1774 1775 1776 1777 1778 1779 1780 1781 1782 1783 1784 1785 1786 1787 1788 1789 1790 1791 1792 1793 1794 1795 1796 1797 1798 1799 1800 1801 1802 1803 1804 1805 1806 1807 1808 1809 1810 1811 1812 1813 1814 1815 1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 			

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-SB36	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/25/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO</b> ∇ 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
			3	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
∇			2					
5								
10								
15								



<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CT0-0031 / N7566
<b>BORING ID:</b> A902-SB37	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/26/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO</b> $\nabla$ 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				1	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
$\nabla$				2					
5									
10									
15									

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-SB38	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/26/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO</b> ∇ 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
			0	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
∇			3					
5								
10								
15								

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CT0-0031 / N7586
<b>BORING ID:</b> A902-SB39	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/26/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO</b> ∇ 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
8				8	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
10				0					
15									

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-SB40	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Sampling, Inc.	<b>COMPLETION DATE:</b> 06/26/98	<b>LOGGED BY:</b> R. Ofsanko
<b>METHOD:</b> EnviroCore DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 6ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO</b> $\nabla$ 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				0	LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
				0					
5									
10									
15									

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-SB41	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Drilling, Inc.	<b>COMPLETION DATE:</b> 08/25/98	<b>LOGGED BY:</b> P. Calligan
<b>METHOD:</b> GeoProbe DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 4ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO ∇</b> 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
0	A902SB4103				LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.				
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									



<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-SB43	<b>WELL ID:</b>	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Drilling, Inc.	<b>COMPLETION DATE:</b> 08/25/98	<b>LOGGED BY:</b> P. Calligan
<b>METHOD:</b> GeoProbe DPT	<b>DIAMETER:</b> 2.5" OD	<b>TOTAL DEPTH:</b> 4ft bls
<b>TOC ELEVATION:</b> ft MSL	<b>SCREEN INTERVAL:</b> ft bls	<b>DEPTH TO ∇</b> 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
4	A902SB4302	X			LIMESTONE, oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular to moldic porosity.	<div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> <div>5</div> <div>6</div> <div>7</div> <div>8</div> <div>9</div> <div>10</div> <div>11</div> <div>12</div> <div>13</div> <div>14</div> <div>15</div> <div>16</div> <div>17</div> <div>18</div> <div>19</div> <div>20</div> <div>21</div> <div>22</div> <div>23</div> <div>24</div> <div>25</div> <div>26</div> <div>27</div> <div>28</div> <div>29</div> <div>30</div> <div>31</div> <div>32</div> <div>33</div> <div>34</div> <div>35</div> <div>36</div> <div>37</div> <div>38</div> <div>39</div> <div>40</div> <div>41</div> <div>42</div> <div>43</div> <div>44</div> <div>45</div> <div>46</div> <div>47</div> <div>48</div> <div>49</div> <div>50</div> <div>51</div> <div>52</div> <div>53</div> <div>54</div> <div>55</div> <div>56</div> <div>57</div> <div>58</div> <div>59</div> <div>60</div> <div>61</div> <div>62</div> <div>63</div> <div>64</div> <div>65</div> <div>66</div> <div>67</div> <div>68</div> <div>69</div> <div>70</div> <div>71</div> <div>72</div> <div>73</div> <div>74</div> <div>75</div> <div>76</div> <div>77</div> <div>78</div> <div>79</div> <div>80</div> <div>81</div> <div>82</div> <div>83</div> <div>84</div> <div>85</div> <div>86</div> <div>87</div> <div>88</div> <div>89</div> <div>90</div> <div>91</div> <div>92</div> <div>93</div> <div>94</div> <div>95</div> <div>96</div> <div>97</div> <div>98</div> <div>99</div> <div>100</div> <div>101</div> <div>102</div> <div>103</div> <div>104</div> <div>105</div> <div>106</div> <div>107</div> <div>108</div> <div>109</div> <div>110</div> <div>111</div> <div>112</div> <div>113</div> <div>114</div> <div>115</div> <div>116</div> <div>117</div> <div>118</div> <div>119</div> <div>120</div> <div>121</div> <div>122</div> <div>123</div> <div>124</div> <div>125</div> <div>126</div> <div>127</div> <div>128</div> <div>129</div> <div>130</div> <div>131</div> <div>132</div> <div>133</div> <div>134</div> <div>135</div> <div>136</div> <div>137</div> <div>138</div> <div>139</div> <div>140</div> <div>141</div> <div>142</div> <div>143</div> <div>144</div> <div>145</div> <div>146</div> <div>147</div> <div>148</div> <div>149</div> <div>150</div> <div>151</div> <div>152</div> <div>153</div> <div>154</div> <div>155</div> <div>156</div> <div>157</div> <div>158</div> <div>159</div> <div>160</div> <div>161</div> <div>162</div> <div>163</div> <div>164</div> <div>165</div> <div>166</div> <div>167</div> <div>168</div> <div>169</div> <div>170</div> <div>171</div> <div>172</div> <div>173</div> <div>174</div> <div>175</div> <div>176</div> <div>177</div> <div>178</div> <div>179</div> <div>180</div> <div>181</div> <div>182</div> <div>183</div> <div>184</div> <div>185</div> <div>186</div> <div>187</div> <div>188</div> <div>189</div> <div>190</div> <div>191</div> <div>192</div> <div>193</div> <div>194</div> <div>195</div> <div>196</div> <div>197</div> <div>198</div> <div>199</div> <div>200</div> <div>201</div> <div>202</div> <div>203</div> <div>204</div> <div>205</div> <div>206</div> <div>207</div> <div>208</div> <div>209</div> <div>210</div> <div>211</div> <div>212</div> <div>213</div> <div>214</div> <div>215</div> <div>216</div> <div>217</div> <div>218</div> <div>219</div> <div>220</div> <div>221</div> <div>222</div> <div>223</div> <div>224</div> <div>225</div> <div>226</div> <div>227</div> <div>228</div> <div>229</div> <div>230</div> <div>231</div> <div>232</div> <div>233</div> <div>234</div> <div>235</div> <div>236</div> <div>237</div> <div>238</div> <div>239</div> <div>240</div> <div>241</div> <div>242</div> <div>243</div> <div>244</div> <div>245</div> <div>246</div> <div>247</div> <div>248</div> <div>249</div> <div>250</div> <div>251</div> <div>252</div> <div>253</div> <div>254</div> <div>255</div> <div>256</div> <div>257</div> <div>258</div> <div>259</div> <div>260</div> <div>261</div> <div>262</div> <div>263</div> <div>264</div> <div>265</div> <div>266</div> <div>267</div> <div>268</div> <div>269</div> <div>270</div> <div>271</div> <div>272</div> <div>273</div> <div>274</div> <div>275</div> <div>276</div> <div>277</div> <div>278</div> <div>279</div> <div>280</div> <div>281</div> <div>282</div> <div>283</div> <div>284</div> <div>285</div> <div>286</div> <div>287</div> <div>288</div> <div>289</div> <div>290</div> <div>291</div> <div>292</div> <div>293</div> <div>294</div> <div>295</div> <div>296</div> <div>297</div> <div>298</div> <div>299</div> <div>300</div> <div>301</div> <div>302</div> <div>303</div> <div>304</div> <div>305</div> <div>306</div> <div>307</div> <div>308</div> <div>309</div> <div>310</div> <div>311</div> <div>312</div> <div>313</div> <div>314</div> <div>315</div> <div>316</div> <div>317</div> <div>318</div> <div>319</div> <div>320</div> <div>321</div> <div>322</div> <div>323</div> <div>324</div> <div>325</div> <div>326</div> <div>327</div> <div>328</div> <div>329</div> <div>330</div> <div>331</div> <div>332</div> <div>333</div> <div>334</div> <div>335</div> <div>336</div> <div>337</div> <div>338</div> <div>339</div> <div>340</div> <div>341</div> <div>342</div> <div>343</div> <div>344</div> <div>345</div> <div>346</div> <div>347</div> <div>348</div> <div>349</div> <div>350</div> <div>351</div> <div>352</div> <div>353</div> <div>354</div> <div>355</div> <div>356</div> <div>357</div> <div>358</div> <div>359</div> <div>360</div> <div>361</div> <div>362</div> <div>363</div> <div>364</div> <div>365</div> <div>366</div> <div>367</div> <div>368</div> <div>369</div> <div>370</div> <div>371</div> <div>372</div> <div>373</div> <div>374</div> <div>375</div> <div>376</div> <div>377</div> <div>378</div> <div>379</div> <div>380</div> <div>381</div> <div>382</div> <div>383</div> <div>384</div> <div>385</div> <div>386</div> <div>387</div> <div>388</div> <div>389</div> <div>390</div> <div>391</div> <div>392</div> <div>393</div> <div>394</div> <div>395</div> <div>396</div> <div>397</div> <div>398</div> <div>399</div> <div>400</div> <div>401</div> <div>402</div> <div>403</div> <div>404</div> <div>405</div> <div>406</div> <div>407</div> <div>408</div> <div>409</div> <div>410</div> <div>411</div> <div>412</div> <div>413</div> <div>414</div> <div>415</div> <div>416</div> <div>417</div> <div>418</div> <div>419</div> <div>420</div> <div>421</div> <div>422</div> <div>423</div> <div>424</div> <div>425</div> <div>426</div> <div>427</div> <div>428</div> <div>429</div> <div>430</div> <div>431</div> <div>432</div> <div>433</div> <div>434</div> <div>435</div> <div>436</div> <div>437</div> <div>438</div> <div>439</div> <div>440</div> <div>441</div> <div>442</div> <div>443</div> <div>444</div> <div>445</div> <div>446</div> <div>447</div> <div>448</div> <div>449</div> <div>450</div> <div>451</div> <div>452</div> <div>453</div> <div>454</div> <div>455</div> <div>456</div> <div>457</div> <div>458</div> <div>459</div> <div>460</div> <div>461</div> <div>462</div> <div>463</div> <div>464</div> <div>465</div> <div>466</div> <div>467</div> <div>468</div> <div>469</div> <div>470</div> <div>471</div> <div>472</div> <div>473</div> <div>474</div> <div>475</div> <div>476</div> <div>477</div> <div>478</div> <div>479</div> <div>480</div> <div>481</div> <div>482</div> <div>483</div> <div>484</div> <div>485</div> <div>486</div> <div>487</div> <div>488</div> <div>489</div> <div>490</div> <div>491</div> <div>492</div> <div>493</div> <div>494</div> <div>495</div> <div>496</div> <div>497</div> <div>498</div> <div>499</div> <div>500</div> <div>501</div> <div>502</div> <div>503</div> <div>504</div> <div>505</div> <div>506</div> <div>507</div> <div>508</div> <div>509</div> <div>510</div> <div>511</div> <div>512</div> <div>513</div> <div>514</div> <div>515</div> <div>516</div> <div>517</div> <div>518</div> <div>519</div> <div>520</div> <div>521</div> <div>522</div> <div>523</div> <div>524</div> <div>525</div> <div>526</div> <div>527</div> <div>528</div> <div>529</div> <div>530</div> <div>531</div> <div>532</div> <div>533</div> <div>534</div> <div>535</div> <div>536</div> <div>537</div> <div>538</div> <div>539</div> <div>540</div> <div>541</div> <div>542</div> <div>543</div> <div>544</div> <div>545</div> <div>546</div> <div>547</div> <div>548</div> <div>549</div> <div>550</div> <div>551</div> <div>552</div> <div>553</div> <div>554</div> <div>555</div> <div>556</div> <div>557</div> <div>558</div> <div>559</div> <div>560</div> <div>561</div> <div>562</div> <div>563</div> <div>564</div> <div>565</div> <div>566</div> <div>567</div> <div>568</div> <div>569</div> <div>570</div> <div>571</div> <div>572</div> <div>573</div> <div>574</div> <div>575</div> <div>576</div> <div>577</div> <div>578</div> <div>579</div> <div>580</div> <div>581</div> <div>582</div> <div>583</div> <div>584</div> <div>585</div> <div>586</div> <div>587</div> <div>588</div> <div>589</div> <div>590</div> <div>591</div> <div>592</div> <div>593</div> <div>594</div> <div>595</div> <div>596</div> <div>597</div> <div>598</div> <div>599</div> <div>600</div> <div>601</div> <div>602</div> <div>603</div> <div>604</div> <div>605</div> <div>606</div> <div>607</div> <div>608</div> <div>609</div> <div>610</div> <div>611</div> <div>612</div> <div>613</div> <div>614</div> <div>615</div> <div>616</div> <div>617</div> <div>618</div> <div>619</div> <div>620</div> <div>621</div> <div>622</div> <div>623</div> <div>624</div> <div>625</div> <div>626</div> <div>627</div> <div>628</div> <div>629</div> <div>630</div> <div>631</div> <div>632</div> <div>633</div> <div>634</div> <div>635</div> <div>636</div> <div>637</div> <div>638</div> <div>639</div> <div>640</div> <div>641</div> <div>642</div> <div>643</div> <div>644</div> <div>645</div> <div>646</div> <div>647</div> <div>648</div> <div>649</div> <div>650</div> <div>651</div> <div>652</div> <div>653</div> <div>654</div> <div>655</div> <div>656</div> <div>657</div> <div>658</div> <div>659</div> <div>660</div> <div>661</div> <div>662</div> <div>663</div> <div>664</div> <div>665</div> <div>666</div> <div>667</div> <div>668</div> <div>669</div> <div>670</div> <div>671</div> <div>672</div> <div>673</div> <div>674</div> <div>675</div> <div>676</div> <div>677</div> <div>678</div> <div>679</div> <div>680</div> <div>681</div> <div>682</div> <div>683</div> <div>684</div> <div>685</div> <div>686</div> <div>687</div> <div>688</div> <div>689</div> <div>690</div> <div>691</div> <div>692</div> <div>693</div> <div>694</div> <div>695</div> <div>696</div> <div>697</div> <div>698</div> <div>699</div> <div>700</div> <div>701</div> <div>702</div> <div>703</div> <div>704</div> <div>705</div> <div>706</div> <div>707</div> <div>708</div> <div>709</div> <div>710</div> <div>711</div> <div>712</div> <div>713</div> <div>714</div> <div>715</div> <div>716</div> <div>717</div> <div>718</div> <div>719</div> <div>720</div> <div>721</div> <div>722</div> <div>723</div> <div>724</div> <div>725</div> <div>726</div> <div>727</div> <div>728</div> <div>729</div> <div>730</div> <div>731</div> <div>732</div> <div>733</div> <div>734</div> <div>735</div> <div>736</div> <div>737</div> <div>738</div> <div>739</div> <div>740</div> <div>741</div> <div>742</div> <div>743</div> <div>744</div> <div>745</div> <div>746</div> <div>747</div> <div>748</div> <div>749</div> <div>750</div> <div>751</div> <div>752</div> <div>753</div> <div>754</div> <div>755</div> <div>756</div> <div>757</div> <div>758</div> <div>759</div> <div>760</div> <div>761</div> <div>762</div> <div>763</div> <div>764</div> <div>765</div> <div>766</div> <div>767</div> <div>768</div> <div>769</div> <div>770</div> <div>771</div> <div>772</div> <div>773</div> <div>774</div> <div>775</div> <div>776</div> <div>777</div> <div>778</div> <div>779</div> <div>780</div> <div>781</div> <div>782</div> <div>783</div> <div>784</div> <div>785</div> <div>786</div> <div>787</div> <div>788</div> <div>789</div> <div>790</div> <div>791</div> <div>792</div> <div>793</div> <div>794</div> <div>795</div> <div>796</div> <div>797</div> <div>798</div> <div>799</div> <div>800</div> <div>801</div> <div>802</div> <div>803</div> <div>804</div> <div>805</div> <div>806</div> <div>807</div> <div>808</div> <div>809</div> <div>810</div> <div>811</div> <div>812</div> <div>813</div> <div>814</div> <div>815</div> <div>816</div> <div>817</div> <div>818</div> <div>819</div> <div>820</div> <div>821</div> <div>822</div> <div>823</div> <div>824</div> <div>825</div> <div>826</div> <div>827</div> <div>828</div> <div>829</div> <div>830</div> <div>831</div> <div>832</div> <div>833</div> <div>834</div> <div>835</div> <div>836</div> <div>837</div> <div>838</div> <div>839</div> <div>840</div> <div>841</div> <div>842</div> <div>843</div> <div>844</div> <div>845</div> <div>846</div> <div>847</div> <div>848</div> <div>849</div> <div>850</div> <div>851</div> <div>852</div> <div>853</div> <div>854</div> <div>855</div> <div>856</div> <div>857</div> <div>858</div> <div>859</div> <div>860</div> <div>861</div> <div>862</div> <div>863</div> <div>864</div> <div>865</div> <div>866</div> <div>867</div> <div>868</div> <div>869</div> <div>870</div> <div>871</div> <div>872</div> <div>873</div> <div>874</div> <div>875</div> <div>876</div> <div>877</div> <div>878</div> <div>879</div> <div>880</div> <div>881</div> <div>882</div> <div>883</div> <div>884</div> <div>885</div> <div>886</div> <div>887</div> <div>888</div> <div>889</div> <div>890</div> <div>891</div> <div>892</div> <div>893</div> <div>894</div> <div>895</div> <div>896</div> <div>897</div> <div>898</div> <div>899</div> <div>900</div> <div>901</div> <div>902</div> <div>903</div> <div>904</div> <div>905</div> <div>906</div> <div>907</div> <div>908</div> <div>909</div> <div>910</div> <div>911</div> <div>912</div> <div>913</div> <div>914</div> <div>915</div> <div>916</div> <div>917</div> <div>918</div> <div>919</div> <div>920</div> <div>921</div> <div>922</div> <div>923</div> <div>924</div> <div>925</div> <div>926</div> <div>927</div> <div>928</div> <div>929</div> <div>930</div> <div>931</div> <div>932</div> <div>933</div> <div>934</div> <div>935</div> <div>936</div> <div>937</div> <div>938</div> <div>939</div> <div>940</div> <div>941</div> <div>942</div> <div>943</div> <div>944</div> <div>945</div> <div>946</div> <div>947</div> <div>948</div> <div>949</div> <div>950</div> <div>951</div> <div>952</div> </div>			

**APPENDIX E**

**WELL COMPLETION LOGS**

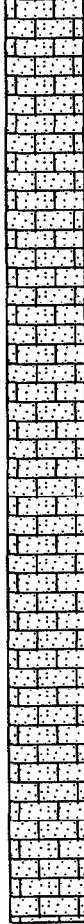
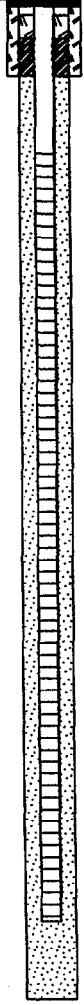








<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-MW01	<b>WELL ID:</b> A902-MW01	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Drilling, Inc.	<b>COMPLETION DATE:</b> 08/26/98	<b>LOGGED BY:</b> P. Calligan
<b>METHOD:</b> Diedrich D-120	<b>DIAMETER:</b> 2" ID	<b>TOTAL DEPTH:</b> 12ft bls
<b>TOC ELEVATION:</b> 4.41 ft MSL	<b>SCREEN INTERVAL:</b> 2 - 12ft bls	<b>DEPTH TO <math>\nabla</math></b> 2.46 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
<div> <div>4</div> <div>5</div> <div>10</div> <div>15</div> </div>					LIMESTONE: oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular and moldic porosity.				

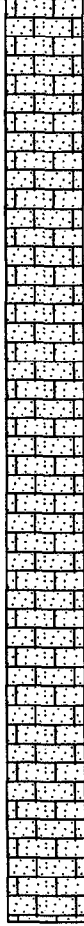
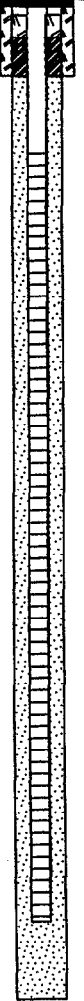


<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-MW03	<b>WELL ID:</b> A902-MW03	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Drilling, Inc.	<b>COMPLETION DATE:</b> 08/26/98	<b>LOGGED BY:</b> P. Calligan
<b>METHOD:</b> Diedrich D-120	<b>DIAMETER:</b> 2" ID	<b>TOTAL DEPTH:</b> 12ft bls
<b>TOC ELEVATION:</b> 4.25 ft MSL	<b>SCREEN INTERVAL:</b> 2 - 12ft bls	<b>DEPTH TO ∇</b> 2.23 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
<div> <div>∇</div> <div>5</div> <div>10</div> <div>15</div> </div>					LIMESTONE: oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular and moldic porosity.				

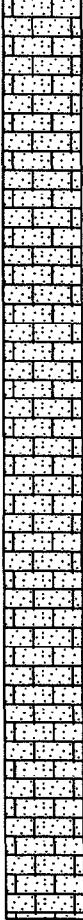
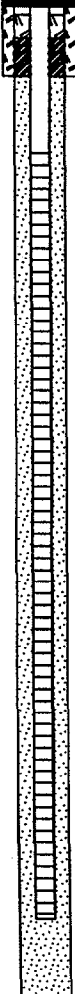


<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-MW05	<b>WELL ID:</b> A902-MW05	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Drilling, Inc.	<b>COMPLETION DATE:</b> 08/26/98	<b>LOGGED BY:</b> P. Calligan
<b>METHOD:</b> Diedrich D-120	<b>DIAMETER:</b> 2" ID	<b>TOTAL DEPTH:</b> 12ft bls
<b>TOC ELEVATION:</b> 4.46 ft MSL	<b>SCREEN INTERVAL:</b> 2 - 12ft bls	<b>DEPTH TO ∇</b> 2.40 ft bls

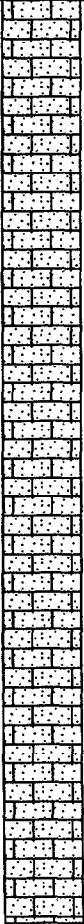
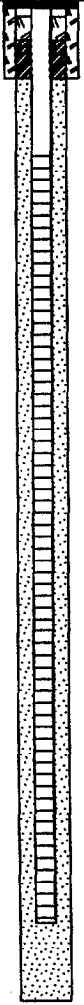
DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
4				LIMESTONE: oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular and moldic porosity.				
5								
10								
15								



<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CT0-0031 / N7586
<b>BORING ID:</b> A902-MW06	<b>WELL ID:</b> A902-MW06	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Drilling, Inc.	<b>COMPLETION DATE:</b> 08/26/98	<b>LOGGED BY:</b> P. Calligan
<b>METHOD:</b> Diedrich D-120	<b>DIAMETER:</b> 2" ID	<b>TOTAL DEPTH:</b> 12ft bls
<b>TOC ELEVATION:</b> 3.99 ft MSL	<b>SCREEN INTERVAL:</b> 2 - 12ft bls	<b>DEPTH TO <math>\nabla</math></b> 1.91 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
4					LIMESTONE: oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular and moldic porosity.				
5									
10									
15									

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-MW07	<b>WELL ID:</b> A902-MW07	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Drilling, Inc.	<b>COMPLETION DATE:</b> 08/26/98	<b>LOGGED BY:</b> P. Calligan
<b>METHOD:</b> Diedrich D-120	<b>DIAMETER:</b> 2" ID	<b>TOTAL DEPTH:</b> 12ft bls
<b>TOC ELEVATION:</b> 4.22 ft MSL	<b>SCREEN INTERVAL:</b> 2 - 12ft bls	<b>DEPTH TO <math>\nabla</math></b> 2.07 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
4					LIMESTONE: oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular and moldic porosity.				
5									
10									
15									

<b>BASE:</b> NAS Key West	<b>SITE ID:</b> Truck Fill Stand	<b>PROJECT NO.</b> CTO-0031 / N7586
<b>BORING ID:</b> A902-MWD8	<b>WELL ID:</b> A902-MWD8	<b>PIEZOMETER ID:</b>
<b>CONTRACTOR:</b> Precision Drilling, Inc.	<b>COMPLETION DATE:</b> 08/25/98	<b>LOGGED BY:</b> P. Calligan
<b>METHOD:</b> Diedrich D-120	<b>DIAMETER:</b> 2" ID	<b>TOTAL DEPTH:</b> 35ft bls
<b>TOC ELEVATION:</b> 4.11 ft MSL	<b>SCREEN INTERVAL:</b> 30 - 35ft bls	<b>DEPTH TO ∇</b> 2.98 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
4			5	LIMESTONE: oolitic, light brown to beige, sandy, coarse grained, some shell fragments, hard, moderately consolidated, moderately to highly weathered, intergranular and moldic porosity.			2/4/3/4	
			100				2/1/2/2	
5			1000				2/4/11/14	
			900				14/11/4/2	
			800				19/14/11/7	
10			700				2/19/15/14	
			900	Decreasing sand content, color grades to predominantly white.			19/27/35/44	
15			Refusal				4/9/50	
			400				8/7/7/35	
			1100				17/49/50	
20			400				14/30/15/20	
			Refusal				49/50	
25			40				40/47/49/48	
			Refusal				37/50	
			30				15/35/50	
30			30				17/27/17/17	
			35				5/12/18/16	
35								

## **APPENDIX F**

### **MOBILE LABORATORY SCREENING RESULTS**

**KB LABS, INC.**  
6821 Southwest Archer Road  
Gainesville, Florida 32608  
*telephone (352) 495-8411*  
*fax (352) 495-8411*

July 6, 1998

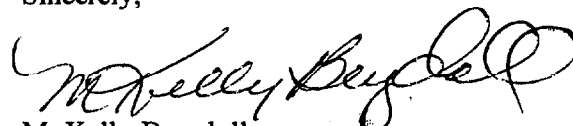
Mr. Paul Calligan  
TetraTech, Inc.  
1311 Executive Center Drive, Suite 220  
Tallahassee, FL 32301

Dear Mr. Calligan:

Enclosed are a Project Narrative and Summary Data Reports for the on-site screening analyses performed by KB Labs, Inc. at Boca Chica NAS from June 22 through 26, 1998. Upon request, I would be glad to provide additional copies of the individual sample data sheets provided in the field.

If you have any questions, please do not hesitate to call me at (352) 377-2349.

Sincerely,

  
M. Kelly Bergdoll  
President

MKB:cms

Enclosures

KB Labs, Inc.  
6821 SW Archer Road  
Gainesville, FL 32618  
(352) 495-8411

**PROJECT NARRATIVE**  
KB Labs Project No.: 002

**Client:** Tetrattech/Brown & Root  
**Project Name:** Boca Chica NAS  
**Onsite Dates:** 6/22/96 - 6/26/98

**Sampler:** Precision Sampling  
**KB Labs Project Manager:** Kelly Bergdoll  
**Client Project Manager:** Paul Calligan

**Project Scope**

Over the five-day period, 40 water samples and 40 soil samples were analyzed in the KB Labs on-site mobile facility. All water samples were screened for both Diesel Range Organics (DRO) and for the individual aromatic gasoline range components - benzene, toluene, ethylbenzene, xylenes (BTEX). All soil samples were screened for DRO, but only 3 soils were screened for BTEX after it was determined from the DRO results that screening of all soil samples for BTEX was not necessary.

**Analytical Screening Methods**

**DRO** - 35 milliliters (mL) of water sample were extracted with 5 mL of hexane. 5 grams (gm) of soil sample were extracted with 5 mL of methanol. 2 microliters (uL) of the sample extract were then injected into a gas chromatograph (GC) and the components were separated by packed column chromatography and measured with a flame ionization detector (FID). Sample components were measured against components in a diesel standard. A single value comprised of a summation of all responses in the diesel range was reported for each screening analysis. This method is a modified version of EPA method 8015 and was designed specifically for rapid field screening analysis.

**BTEX** - 5 mL of water sample were purged with helium and the volatile components were collected on a solid - phase adsorption trap. 5 gm of soil sample were first extracted with 5 mL of methanol and a 100-uL aliquot of the methanol extract was then added to 5 mL of laboratory reagent water which were then purged with helium like a water sample. The adsorption trap was then heated and back-purged with helium and the components were separated by capillary column gas chromatography and measured with a mass spectrometer (GC/MS) operated in the electron impact full-scan mode. The individual BTEX components in the samples were then measured against BTEX standards. This method was based on EPA Method 8260b with minor changes designed to better accommodate the method for more rapid field screening analysis.

**Screening Data**

Laboratory screening results were provided to the client on an as-completed or next-day basis. For DRO reported data, the established reporting limits or practical quantitation limits were 3 milligrams per liter (mg/L) for the water samples and 20 milligrams per kilogram (mg/kg) for the soil samples. For BTEX reported data, the reporting limits or practical quantitation limits were 5 micrograms/liter (ug/L) for the water samples and 250 ug/L for the soil samples. (A 5-mL purging vessel was used instead of a 25-mL vessel in order to restrict sample foaming due to excess turbidity. This increased the laboratory's established PQLs by a factor of 5.) During BTEX analysis, GC/MS chromatograms were also routinely screened by the analyst for MTBE and halogenated volatiles, none of which were detected. Correlation data for naphthalene was also collected by the GC/MS analyst and is available if needed. All data produced in the field has been reviewed and approved by the KB Labs, Inc. QA Officer.

Signature:  Title: Quality Assurance Officer

Date: July 6, 1998

KB Labs, Inc.  
6821 SW Archer Road  
Gainesville, FL 32618  
(352) 495-8411

# SUMMARY DATA REPORT

Client: Tetrattech/Brown & Root	Sampler: Precision Sampling	Project No: 002
Project Name: Boca Chica NAS	KB Labs Project Manager: Kelly Bergdoll	Matrix: Wafer
Onsite Dates: 6/22/98 - 6/26/98	Client Project Manager: Paul Calligan	

Sample ID	DRO (mg/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
SB01-MLW	9.26	ND	ND	ND	ND
SB02-MLW	19.4	10.7	ND	ND	ND
SB03-MLW	11.3	ND	ND	ND	ND
SB04-MLW	10.2	ND	ND	ND	ND
SB05-MLW	9.61	ND	ND	ND	ND
SB06-MLW	9.56	>200	ND	ND	ND
SB07-MLW	10.6	ND	ND	ND	ND
SB08-MLW	9.3	14.8	ND	ND	ND
SB09-MLW	9.94	33.1	ND	ND	ND
SB10-MLW	9.24	ND	ND	ND	ND
SB11-MLW	ND	>150	ND	ND	ND
SB12-MLW	ND	ND	ND	ND	ND
SB13-MLW	ND	ND	ND	ND	ND
SB14-MLW	ND	ND	ND	ND	ND
SB15-MLW	ND	ND	ND	ND	ND
SB16-MLW	ND	ND	ND	ND	ND
SB17-MLW	ND	ND	ND	ND	ND
SB18-MLW	ND	ND	ND	ND	ND
SB19-MLW	13.5	ND	ND	ND	ND
SB20-MLW	ND	ND	ND	ND	ND
SB21-MLW	ND	ND	ND	ND	ND
SB22-MLW	ND	ND	ND	ND	ND
SB23-MLW	ND	ND	ND	ND	ND
SB24-MLW	ND	ND	ND	ND	ND
SB25-MLW	ND	ND	ND	ND	ND
SB26-ML36	ND	ND	ND	ND	ND
SB27-ML36	ND	ND	12.1	2.8	8.8
SB28-ML36	ND	ND	ND	ND	ND
SB29-ML36	ND	ND	ND	ND	ND
SB30-ML03	ND	ND	ND	ND	ND
SB31-ML36	ND	ND	ND	ND	ND
SB32-ML36	ND	ND	ND	ND	ND
SB33-ML36	ND	ND	ND	ND	ND
SB34-ML36	ND	ND	ND	ND	ND
SB35-ML03	ND	ND	ND	ND	ND
SB36-ML03	ND	10.4	ND	ND	ND
SB37-ML03	ND	ND	ND	ND	ND
SB38-ML36	ND	ND	ND	ND	ND
SB39-ML03	ND	ND	ND	>200	ND
SB40-ML03	ND	7.8	4.7	ND	ND

Note: Practical Quantitation Limits (PQLs) = 3 mg/L (DRO), 5 ug/L (BTEX) ND = Not Detected NA = Not Analyzed

KB Labs, Inc.  
6821 SW Archer Road  
Gainesville, FL 32618  
(352) 495-8411

### SUMMARY DATA REPORT

Client: Tetrattech/Brown & Root	Sampler: Precision Sampling	Project No: 002
Project Name: Boca Chica NAS	KB Labs Project Manager: Kelly Bergdoll	Matrix: Soil
Onsite Dates: 6/22/98 - 6/26/98	Client Project Manager: Paul Calligan	

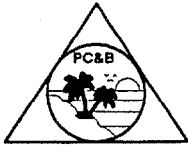
Sample ID	DRO (mg/kg)	Benzene (ug/kg)	Toluene (ug/kg)	Ethylbenzene (ug/kg)	Total Xylenes (ug/kg)
SB01-ML03	22,100	NA	NA	NA	NA
SB02-ML03	18,100	NA	NA	NA	NA
SB03-ML36	219	NA	NA	NA	NA
SB04-ML03	9,260	NA	NA	NA	NA
SB05-ML03	311	NA	NA	NA	NA
SB06-ML03	89	NA	NA	NA	NA
SB07-ML03	14,900	NA	NA	NA	NA
SB08-ML36	239	NA	NA	NA	NA
SB09-ML36	1,830	NA	NA	NA	NA
SB10-ML03	1,210	NA	NA	NA	NA
SB11-ML36	164	NA	NA	NA	NA
SB12-ML03	8,790	NA	NA	NA	NA
SB13-ML03	1,520	NA	NA	NA	NA
SB14-ML03	ND	NA	NA	NA	NA
SB15-ML03	ND	NA	NA	NA	NA
SB16-ML36	176	NA	NA	NA	NA
SB17-ML36	3,580	NA	NA	NA	NA
SB18-ML36	2,660	NA	NA	NA	NA
SB19-ML36	64	NA	NA	NA	NA
SB20-ML36	ND	NA	NA	NA	NA
SB21-ML36	57	NA	NA	NA	NA
SB22-ML36	54	NA	NA	NA	NA
SB23-ML36	ND	ND	ND	ND	ND
SB24-ML36	78	ND	ND	ND	ND
SB25-ML36	ND	ND	ND	ND	ND
SB26-ML36	ND	NA	NA	NA	NA
SB27-ML36	147	NA	NA	NA	NA
SB28-ML36	469	NA	NA	NA	NA
SB29-ML36	ND	NA	NA	NA	NA
SB30-ML03	58	NA	NA	NA	NA
SB31-ML36	462	NA	NA	NA	NA
SB32-ML36	ND	NA	NA	NA	NA
SB33-ML36	170	NA	NA	NA	NA
SB34-ML36	ND	NA	NA	NA	NA
SB35-ML03	58	NA	NA	NA	NA
SB36-ML03	ND	NA	NA	NA	NA
SB37-ML03	ND	NA	NA	NA	NA
SB38-ML36	ND	NA	NA	NA	NA
SB39-ML03	ND	NA	NA	NA	NA
SB40-ML03	ND	NA	NA	NA	NA

Note: Practical Quantitation Limits (PQLs) = 20 mg/kg (DRO), 250 ug/kg (BTEX) ND = Not Detected NA = Not Analyzed



## **APPENDIX G**

### **LABORATORY ANALYTICAL REPORTS FOR SOIL AND SEDIMENT**



## **PC&B Environmental Laboratories, Inc.**

210 Park Road, Oviedo, Florida 32765  
Phone: 407-359-7194 Fax: 407-359-7197

09-16-1998

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

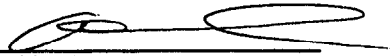
Dear Paul Calligan:

Enclosed are the results of the analysis of your samples received 08/26/1998.

Our laboratory is certified by the Florida DHRS (Lab #E83239) and operates under an FDEP approved Comprehensive Quality Assurance Plan (#900134G). Unless otherwise noted, all results are reported as received. All data were determined in accordance with published procedures (EPA-600/4-79-020), Methods for Chemical Analysis of Water and Wastes, Revised March 1983 and/or Standard Methods for the examination of Water and Wastewater, 18th Edition 1989 and/or Test Methods for Evaluating Solid Waste (EPA-SW-846, Revised January 1995), unless stated otherwise in our CompQapp under method modifications.

If you have any questions, please do not hesitate to give me a call.

Sincerely,

  
\_\_\_\_\_  
Andrew Harrison  
Laboratory Manager



## PC&B Environmental Laboratories, Inc.

210 Park Road, Oviedo, Florida 32765  
Phone: 407-359-7194 Fax: 407-359-7197

Client : Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

Contact : Paul Calligan  
Phone : (850) 656-5458

**Laboratory Reference Number : 98080182**

Project Name : Truck Fill Stand/NAS Key West

Project Number : 7586/CTO-0031

Chain of Custody : 10945

Sample temperature at time of receipt: 4 degrees C

Laboratory ID	Matrix	Client ID	Status	Date/Time Sampled
98080182-1	Soil	A902-SB41-03	RUN	08/25/1998 15:45
98080182-2	Soil	A902-SB42-02	RUN	08/25/1998 16:15
98080182-3	Soil	A902-SB43-02	RUN	08/25/1998 16:45
98080182-4	Water	EQBL	RUN	08/25/1998 16:45

Number	Parameter	Description
1	EPA 8310	PAH's by HPLC
3	FL-PRO	Petroleum Hydrocarbons
1	FL-PRO	Petroleum Hydrocarbons
3	EPA 8100	Polynuclear Aromatic Hydrocarbons
3	EPA 8021	Volatile Organics
1	EPA 8021	Volatile Organics
3	EPA 415.1	Total Organic Carbon

## Case Narrative

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

CASE NARRATIVE for Work Order: 98080182  
Project Number: 7586/CTO-0031  
Project Name: Truck Fill Stand/NAS Key West

This Case Narrative is a summary of events and/or problems encountered with this Work Order.

NOTE: EPA 8310 hits less than 1ppb cannot be confirmed.

Analysis for EPA 8100 in place of EPA 8310 was authorized by Mr. Calligan on 8/30/98.

For samples requesting EPA 8021 analysis, the GCMS method EPA 624 was substituted in order to generate the highest quality data at no additional cost.

Analysis for TOC was performed by Bottorf, FHRS#E83283.

### Definition of Flags

DL	=	No surrogate result due to dilution or matrix interference.
J	=	Estimated Value, value not accurate.
L	=	Off-scale high. Actual value is greater than value given.
T	=	Value reported is less than the laboratory method detection limit.
V	=	Analyte was detected in the blank and sample.

## QC Batch Summary

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

QC BATCH SUMMARY for Work Order: 98080182  
Project Number: 7586/CTO-0031  
Project Name: Truck Fill Stand/NAS Key West

Method	SubNum	QC Batch
<b>EPA 8310 - PAH's by HPLC</b>		
	-4	9808PAH110
<b>FL-PRO - Petroleum Hydrocarbons</b>		
	-1	9808FLRO102
	-2	9808FLRO102
	-3	9808FLRO102
<b>FL-PRO - Petroleum Hydrocarbons</b>		
	-4	9808FLRO099
<b>EPA 8100 - Polynuclear Aromatic Hydrocarbons</b>		
	-1	9808PAH106
	-2	9808PAH106
	-3	9808PAH106
<b>EPA 415.1 - Total Organic Carbon</b>		
<b>EPA 8021 - Volatile Organics</b>		
	-1	9809MS1007
	-2	9809MS1007
	-3	9809MS1007
<b>EPA 8021 - Volatile Organics</b>		
	-4	9808MS2052

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand/NAS Key West  
PROJECT NUMBER: 7586/CTO-0031  
DATE RECEIVED: 08/26/1998  
ANALYTICAL PROTOCOL: EPA 8021

Lab Reference Number : 98080182-1  
Client Sample ID : A902-SB41-03  
Date Sampled : 08/25/1998  
Date Extracted : 08/26/1998  
Date Analyzed : 09/03/1998  
Sample Matrix (as Received): Soil  
Analysis Confirmed : GCMS  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
5	Benzene	5 U	ug/kg	NM
5	Bromobenzene	5 U	ug/kg	NM
5	Bromochloromethane	5 U	ug/kg	NM
5	Bromodichloromethane	5 U	ug/kg	NM
5	Bromoform	5 U	ug/kg	NM
5	Bromomethane	5 U	ug/kg	NM
5	n-Butylbenzene	5 U	ug/kg	NM
5	sec-Butylbenzene	5 U	ug/kg	NM
5	tert-Butylbenzene	5 U	ug/kg	NM
5	Carbon tetrachloride	5 U	ug/kg	NM
5	Chlorobenzene	5 U	ug/kg	NM
5	Chloroethane	5 U	ug/kg	NM
5	Chloroform	5 U	ug/kg	NM
5	Chloromethane	5 U	ug/kg	NM
5	2-Chlorotoluene	5 U	ug/kg	NM
5	4-Chlorotoluene	5 U	ug/kg	NM
5	Dibromochloromethane	5 U	ug/kg	NM
5	1,2-Dibromoethane	5 U	ug/kg	NM
5	Dibromomethane	5 U	ug/kg	NM
5	1,2-Dichlorobenzene	5 U	ug/kg	NM
5	1,3-Dichlorobenzene	5 U	ug/kg	NM
5	1,4-Dichlorobenzene	5 U	ug/kg	NM
5	Dichlorodifluoromethane	5 U	ug/kg	NM
5	1,1-Dichloroethane	5 U	ug/kg	NM
5	1,2-Dichloroethane	5 U	ug/kg	NM
5	1,1-Dichloroethene	5 U	ug/kg	NM
5	cis-1,2-Dichloroethene	5 U	ug/kg	NM
5	trans-1,2-Dichloroethene	5 U	ug/kg	NM
5	1,2-Dichloropropane	5 U	ug/kg	NM
5	1,3-Dichloropropane	5 U	ug/kg	NM
5	2,2-Dichloropropane	5 U	ug/kg	NM
5	1,1-Dichloropropene	5 U	ug/kg	NM
5	Ethylbenzene	5 U	ug/kg	NM
5	Hexachlorobutadiene	5 U	ug/kg	NM
5	Isopropylbenzene	5 U	ug/kg	NM
5	p-Isopropyltoluene	5 U	ug/kg	NM
5	Methylene chloride	22 V	ug/kg	NM
5	Naphthalene	5 U	ug/kg	NM
5	n-Propylbenzene	12	ug/kg	NM
5	Styrene	5 U	ug/kg	NM
5	1,1,1,2-Tetrachloroethane	5 U	ug/kg	NM
5	1,1,2,2-Tetrachloroethane	5 U	ug/kg	NM
5	Tetrachloroethene	5 U	ug/kg	NM
5	Toluene	5 U	ug/kg	NM
5	1,2,3-Trichlorobenzene	5 U	ug/kg	NM
5	1,2,4-Trichlorobenzene	5 U	ug/kg	NM
5	1,1,1-Trichloroethane	5 U	ug/kg	NM
5	1,1,2-Trichloroethane	5 U	ug/kg	NM
5	Trichloroethene	5 U	ug/kg	NM
5	Trichlorofluoromethane	5 U	ug/kg	NM
5	1,2,3-Trichloropropane	5 U	ug/kg	NM
5	1,2,4-Trimethylbenzene	49	ug/kg	NM
5	1,3,5-Trimethylbenzene	15	ug/kg	NM
5	Vinyl chloride	5 U	ug/kg	NM

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand/NAS Key West  
PROJECT NUMBER: 7586/CTO-0031  
DATE RECEIVED: 08/26/1998  
ANALYTICAL PROTOCOL: EPA 8021

Lab Reference Number : 98080182-1  
Client Sample ID : A902-SB41-03  
Date Sampled : 08/25/1998  
Date Extracted : 08/26/1998  
Date Analyzed : 09/03/1998  
Sample Matrix (as Received): Soil  
Analysis Confirmed : GCMS  
Dilution Factor : 1

	MDL	Analyte		Results/Flag	Units	Analyst
5		m&p-Xylenes	5 U	ug/kg	NM	
5		o-Xylene	5 U	ug/kg	NM	
5		MTBE	5 U	ug/kg	NM	
		(Surr) 1,2-Dichloroethane-d4 (%)	88	%	NM	
		(Surr) Toluene-d8 (%)	95	%	NM	
		(Surr) 4-Bromofluorobenzene (%)	130	%	NM	

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRs Certification # E83239/83353

Reviewed by : 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand/NAS Key West  
PROJECT NUMBER: 7586/CTO-0031  
DATE RECEIVED: 08/26/1998  
ANALYTICAL PROTOCOL: EPA 8021

Lab Reference Number : 98080182-2  
Client Sample ID : A902-SB42-02  
Date Sampled : 08/25/1998  
Date Extracted : 08/26/1998  
Date Analyzed : 09/03/1998  
Sample Matrix (as Received): Soil  
Analysis Confirmed : GCMS  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
5	Benzene	5 U	ug/kg	NM
5	Bromobenzene	5 U	ug/kg	NM
5	Bromochloromethane	5 U	ug/kg	NM
5	Bromodichloromethane	5 U	ug/kg	NM
5	Bromoform	5 U	ug/kg	NM
5	Bromomethane	5 U	ug/kg	NM
5	n-Butylbenzene	5 U	ug/kg	NM
5	sec-Butylbenzene	5 U	ug/kg	NM
5	tert-Butylbenzene	5 U	ug/kg	NM
5	Carbon tetrachloride	5 U	ug/kg	NM
5	Chlorobenzene	5 U	ug/kg	NM
5	Chloroethane	5 U	ug/kg	NM
5	Chloroform	5 U	ug/kg	NM
5	Chloromethane	5 U	ug/kg	NM
5	2-Chlorotoluene	5 U	ug/kg	NM
5	4-Chlorotoluene	5 U	ug/kg	NM
5	Dibromochloromethane	5 U	ug/kg	NM
5	1,2-Dibromoethane	5 U	ug/kg	NM
5	Dibromomethane	5 U	ug/kg	NM
5	1,2-Dichlorobenzene	5 U	ug/kg	NM
5	1,3-Dichlorobenzene	5 U	ug/kg	NM
5	1,4-Dichlorobenzene	5 U	ug/kg	NM
5	Dichlorodifluoromethane	5 U	ug/kg	NM
5	1,1-Dichloroethane	5 U	ug/kg	NM
5	1,2-Dichloroethane	5 U	ug/kg	NM
5	1,1-Dichloroethene	5 U	ug/kg	NM
5	cis-1,2-Dichloroethene	5 U	ug/kg	NM
5	trans-1,2-Dichloroethene	5 U	ug/kg	NM
5	1,2-Dichloropropane	5 U	ug/kg	NM
5	1,3-Dichloropropane	5 U	ug/kg	NM
5	2,2-Dichloropropane	5 U	ug/kg	NM
5	1,1-Dichloropropene	5 U	ug/kg	NM
5	Ethylbenzene	5 U	ug/kg	NM
5	Hexachlorobutadiene	5 U	ug/kg	NM
5	Isopropylbenzene	5 U	ug/kg	NM
5	p-Isopropyltoluene	5 U	ug/kg	NM
5	Methylene chloride	21 V	ug/kg	NM
5	Naphthalene	5 U	ug/kg	NM
5	n-Propylbenzene	13	ug/kg	NM
5	Styrene	5 U	ug/kg	NM
5	1,1,1,2-Tetrachloroethane	5 U	ug/kg	NM
5	1,1,2,2-Tetrachloroethane	5 U	ug/kg	NM
5	Tetrachloroethene	5 U	ug/kg	NM
5	Toluene	5 U	ug/kg	NM
5	1,2,3-Trichlorobenzene	5 U	ug/kg	NM
5	1,2,4-Trichlorobenzene	5 U	ug/kg	NM
5	1,1,1-Trichloroethane	5 U	ug/kg	NM
5	1,1,2-Trichloroethane	5 U	ug/kg	NM
5	Trichloroethene	5 U	ug/kg	NM
5	Trichlorofluoromethane	5 U	ug/kg	NM
5	1,2,3-Trichloropropane	5 U	ug/kg	NM
5	1,2,4-Trimethylbenzene	71	ug/kg	NM
5	1,3,5-Trimethylbenzene	26	ug/kg	NM
5	Vinyl chloride	5 U	ug/kg	NM



PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand/NAS Key West  
PROJECT NUMBER: 7586/CTO-0031  
DATE RECEIVED: 08/26/1998  
ANALYTICAL PROTOCOL: EPA 8021

Lab Reference Number : 98080182-2  
Client Sample ID : A902-SB42-02  
Date Sampled : 08/25/1998  
Date Extracted : 08/26/1998  
Date Analyzed : 09/03/1998  
Sample Matrix (as Received): Soil  
Analysis Confirmed : GCMS  
Dilution Factor : 1

	MDL	Analyte		Results/Flag	Units	Analyst
5		m&p-Xylenes	5 U	ug/kg	NM	
5		o-Xylene	5 U	ug/kg	NM	
5		MTBE	5 U	ug/kg	NM	
		(Surr) 1,2-Dichloroethane-d4 (%)	92	%	NM	
		(Surr) Toluene-d8 (%)	98	%	NM	
		(Surr) 4-Bromofluorobenzene (%)	137	%	NM	

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand/NAS Key West  
PROJECT NUMBER: 7586/CTO-0031  
DATE RECEIVED: 08/26/1998  
ANALYTICAL PROTOCOL: EPA 8021

Lab Reference Number : 98080182-3  
Client Sample ID : A902-SB43-02  
Date Sampled : 08/25/1998  
Date Extracted : 08/26/1998  
Date Analyzed : 09/03/1998  
Sample Matrix (as Received): Soil  
Analysis Confirmed : GCMS  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
5	Benzene	5 U	ug/kg	NM
5	Bromobenzene	5 U	ug/kg	NM
5	Bromochloromethane	5 U	ug/kg	NM
5	Bromodichloromethane	5 U	ug/kg	NM
5	Bromoform	5 U	ug/kg	NM
5	Bromomethane	5 U	ug/kg	NM
5	n-Butylbenzene	5 U	ug/kg	NM
5	sec-Butylbenzene	5 U	ug/kg	NM
5	tert-Butylbenzene	5 U	ug/kg	NM
5	Carbon tetrachloride	5 U	ug/kg	NM
5	Chlorobenzene	5 U	ug/kg	NM
5	Chloroethane	5 U	ug/kg	NM
5	Chloroform	5 U	ug/kg	NM
5	Chloromethane	5 U	ug/kg	NM
5	2-Chlorotoluene	5 U	ug/kg	NM
5	4-Chlorotoluene	5 U	ug/kg	NM
5	Dibromochloromethane	5 U	ug/kg	NM
5	1,2-Dibromoethane	5 U	ug/kg	NM
5	Dibromomethane	5 U	ug/kg	NM
5	1,2-Dichlorobenzene	5 U	ug/kg	NM
5	1,3-Dichlorobenzene	5 U	ug/kg	NM
5	1,4-Dichlorobenzene	5 U	ug/kg	NM
5	Dichlorodifluoromethane	5 U	ug/kg	NM
5	1,1-Dichloroethane	5 U	ug/kg	NM
5	1,2-Dichloroethane	5 U	ug/kg	NM
5	1,1-Dichloroethene	5 U	ug/kg	NM
5	cis-1,2-Dichloroethene	5 U	ug/kg	NM
5	trans-1,2-Dichloroethene	5 U	ug/kg	NM
5	1,2-Dichloropropane	5 U	ug/kg	NM
5	1,3-Dichloropropane	5 U	ug/kg	NM
5	2,2-Dichloropropane	5 U	ug/kg	NM
5	1,1-Dichloropropene	5 U	ug/kg	NM
5	Ethylbenzene	5 U	ug/kg	NM
5	Hexachlorobutadiene	5 U	ug/kg	NM
5	Isopropylbenzene	5 U	ug/kg	NM
5	p-Isopropyltoluene	5 U	ug/kg	NM
5	Methylene chloride	20 V	ug/kg	NM
5	Naphthalene	5 U	ug/kg	NM
5	n-Propylbenzene	5 U	ug/kg	NM
5	Styrene	5 U	ug/kg	NM
5	1,1,1,2-Tetrachloroethane	5 U	ug/kg	NM
5	1,1,2,2-Tetrachloroethane	5 U	ug/kg	NM
5	Tetrachloroethene	5 U	ug/kg	NM
5	Toluene	5 U	ug/kg	NM
5	1,2,3-Trichlorobenzene	5 U	ug/kg	NM
5	1,2,4-Trichlorobenzene	5 U	ug/kg	NM
5	1,1,1-Trichloroethane	5 U	ug/kg	NM
5	1,1,2-Trichloroethane	5 U	ug/kg	NM
5	Trichloroethene	5 U	ug/kg	NM
5	Trichlorofluoromethane	5 U	ug/kg	NM
5	1,2,3-Trichloropropane	5 U	ug/kg	NM
5	1,2,4-Trimethylbenzene	5 U	ug/kg	NM
5	1,3,5-Trimethylbenzene	5 U	ug/kg	NM
5	Vinyl chloride	5 U	ug/kg	NM

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand/NAS Key West  
PROJECT NUMBER: 7586/CTO-0031  
DATE RECEIVED: 08/26/1998  
ANALYTICAL PROTOCOL: EPA 8021

Lab Reference Number : 98080182-3  
Client Sample ID : A902-SB43-02  
Date Sampled : 08/25/1998  
Date Extracted : 08/26/1998  
Date Analyzed : 09/03/1998  
Sample Matrix (as Received): Soil  
Analysis Confirmed : GCMS  
Dilution Factor : 1

	MDL	Analyte		Results/Flag	Units	Analyst
5		m&p-Xylenes	5 U	ug/kg	NM	
5		o-Xylene	5 U	ug/kg	NM	
5		MTBE	5 U	ug/kg	NM	
		(Surr) 1,2-Dichloroethane-d4 (%)	100	%	NM	
		(Surr) Toluene-d8 (%)	97	%	NM	
		(Surr) 4-Bromofluorobenzene (%)	138	%	NM	

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRs Certification # E83239/83353

Reviewed by : 

# Quality Control Report for Method Blank

## Volatile Organics

Matrix: Soil

Lab Sample ID: RB-09-03-98

QC Batch ID: 9809MS1007

Result Units: ug/kg

Analysis Date: 09/03/1998

Preparation Date: 09/03/1998

Method: EPA 8021

Analyst: NM

Analyte	Result	Flag	Analyte	Result	Flag
Benzene	5	U	Bromobenzene	5	U
Bromochloromethane	5	U	Bromodichloromethane	5	U
Bromoform	5	U	Bromomethane	5	U
n-Butylbenzene	5	U	sec-Butylbenzene	5	U
tert-Butylbenzene	5	U	Carbon tetrachloride	5	U
Chlorobenzene	5	U	Chloroethane	5	U
Chloroform	5	U	Chloromethane	5	U
2-Chlorotoluene	5	U	4-Chlorotoluene	5	U
Dibromochloromethane	5	U	1,2-Dibromoethane	5	U
Dibromomethane	5	U	1,2-Dichlorobenzene	5	U
1,3-Dichlorobenzene	5	U	1,4-Dichlorobenzene	5	U
Dichlorodifluoromethane	5	U	1,1-Dichloroethane	5	U
1,2-Dichloroethane	5	U	1,1-Dichloroethene	5	U
cis-1,2-Dichloroethene	5	U	trans-1,2-Dichloroethene	5	U
1,2-Dichloropropane	5	U	1,3-Dichloropropane	5	U
2,2-Dichloropropane	5	U	1,1-Dichloropropene	5	U
Ethylbenzene	5	U	Hexachlorobutadiene	5	U
Isopropylbenzene	5	U	p-Isopropyltoluene	5	U
Methylene chloride	15		Naphthalene	5	U
n-Propylbenzene	5	U	Styrene	5	U
1,1,1,2-Tetrachloroethane	5	U	1,1,2,2-Tetrachloroethane	5	U
Tetrachloroethene	5	U	Toluene	5	U
1,2,3-Trichlorobenzene	5	U	1,2,4-Trichlorobenzene	5	U
1,1,1-Trichloroethane	5	U	1,1,2-Trichloroethane	5	U
Trichloroethene	5	U	Trichlorofluoromethane	5	U
1,2,3-Trichloropropane	5	U	1,2,4-Trimethylbenzene	5	U
1,3,5-Trimethylbenzene	5	U	Vinyl chloride	5	U
m&p-Xylenes	5	U	o-Xylene	5	U
(Surr) 1,2-Dichloroethane-d4 (%)	111		(Surr) Toluene-d8 (%)	104	
(Surr) 4-Bromofluorobenzene (%)	118		MTBE	5	U

# Quality Control Report for LCS Analysis

## Volatile Organics

Matrix: Soil  
Lab Sample ID: LCS  
QC Batch ID: 9809MS1007  
LCS Units: ug/kg

Analysis Date: 09/03/1998  
Preparation Date: 09/03/1998  
Method: EPA 8021  
Analyst: NM

Analyte	LCS Conc	LCS Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Benzene	20	21	105	69	139
Carbon tetrachloride	20	18	90	64	134
Chlorobenzene	20	20	100	77	127
1,4-Dichlorobenzene	20	24	120	80	125
1,1-Dichloroethene	20	22	110	64	137
Ethylbenzene	20	19	95	66	128
Toluene	20	17	85	65	135
Trichloroethene	20	19	95	69	136

# Quality Control Report for Spike/Spike Duplicate Analysis

## Volatile Organics

Matrix: Soil

Lab Sample ID: 9809007-3

QC Batch ID: 9809MS1007

Spike Units: ug/kg

Analysis Date: 09/03/1998

Preparation Date: 09/03/1998

Method: EPA 8021

Analyst: NM

Analyte	Spike Amount	Sample Result	Spike Result	Spike Percent Recovery	MSD Result	MSD Percent Recovery	RPD
Benzene	50	0	49	98	53	106	8
Carbon tetrachloride	50	0	57	114	51	102	11
Chlorobenzene	50	0	48	96	51	102	6
1,4-Dichlorobenzene	50	0	54	108	60	120	11
1,1-Dichloroethene	50	0	52	104	52	104	0
Ethylbenzene	50	0	49	98	49	98	0
Toluene	50	0	42	84	45	90	7
Trichloroethene	50	0	53	106	52	104	2

### Quality Control Limits

Analyte	Lower Limit	Upper Limit	RPD
Benzene	59	144	18
Carbon tetrachloride	49	148	15
Chlorobenzene	67	130	18
1,4-Dichlorobenzene	56	141	18
1,1-Dichloroethene	52	143	18
Ethylbenzene	42	157	19
Toluene	54	136	19
Trichloroethene	59	144	18

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand/NAS Key West  
PROJECT NUMBER: 7586/CTO-0031  
DATE RECEIVED: 08/26/1998  
ANALYTICAL PROTOCOL: EPA 8021

Lab Reference Number : 98080182-4  
Client Sample ID : EQBL  
Date Sampled : 08/25/1998  
Date Extracted : 08/27/1998  
Date Analyzed : 08/27/1998  
Sample Matrix (as Received): Water  
Analysis Confirmed : GCMS  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
1.0	Benzene	1.0 U	ug/l	NM
1.0	Bromobenzene	1.0 U	ug/l	NM
1.0	Bromochloromethane	1.0 U	ug/l	NM
1.0	Bromodichloromethane	1.0 U	ug/l	NM
1.0	Bromoform	1.0 U	ug/l	NM
1.0	Bromomethane	1.0 U	ug/l	NM
1.0	n-Butylbenzene	1.0 U	ug/l	NM
1.0	sec-Butylbenzene	1.0 U	ug/l	NM
1.0	tert-Butylbenzene	1.0 U	ug/l	NM
1.0	Carbon tetrachloride	1.0 U	ug/l	NM
1.0	Chlorobenzene	1.0 U	ug/l	NM
1.0	Chloroethane	1.0 U	ug/l	NM
1.0	Chloroform	1.0 U	ug/l	NM
1.0	Chloromethane	1.0 U	ug/l	NM
1.0	2-Chlorotoluene	1.0 U	ug/l	NM
1.0	4-Chlorotoluene	1.0 U	ug/l	NM
1.0	Dibromochloromethane	1.0 U	ug/l	NM
1.0	1,2-Dibromoethane	1.0 U	ug/l	NM
1.0	Dibromomethane	1.0 U	ug/l	NM
1.0	1,2-Dichlorobenzene	1.0 U	ug/l	NM
1.0	1,3-Dichlorobenzene	1.0 U	ug/l	NM
1.0	1,4-Dichlorobenzene	1.0 U	ug/l	NM
1.0	Dichlorodifluoromethane	1.0 U	ug/l	NM
1.0	1,1-Dichloroethane	1.0 U	ug/l	NM
1.0	1,2-Dichloroethane	1.0 U	ug/l	NM
1.0	1,1-Dichloroethene	1.0 U	ug/l	NM
1.0	cis-1,2-Dichloroethene	1.0 U	ug/l	NM
1.0	trans-1,2-Dichloroethene	1.0 U	ug/l	NM
1.0	1,2-Dichloropropane	1.0 U	ug/l	NM
1.0	1,3-Dichloropropane	1.0 U	ug/l	NM
1.0	2,2-Dichloropropane	1.0 U	ug/l	NM
1.0	1,1-Dichloropropene	1.0 U	ug/l	NM
1.0	1,3-Dichloropropene (cis)	1.0 U	ug/l	NM
1.0	1,3-Dichloropropene (trans)	1.0 U	ug/l	NM
1.0	Ethylbenzene	1.0 U	ug/l	NM
1.0	Hexachlorobutadiene	1.0 U	ug/l	NM
1.0	Isopropylbenzene	1.0 U	ug/l	NM
1.0	p-Isopropyltoluene	1.0 U	ug/l	NM
1.0	Methylene chloride	6.5 V	ug/l	NM
1.0	Naphthalene	1.0 U	ug/l	NM
1.0	n-Propylbenzene	1.0 U	ug/l	NM
1.0	Styrene	1.0 U	ug/l	NM
1.0	1,1,1,2-Tetrachloroethane	1.0 U	ug/l	NM
1.0	1,1,2,2-Tetrachloroethane	1.0 U	ug/l	NM
1.0	Tetrachloroethene	1.0 U	ug/l	NM
1.0	Toluene	1.0 U	ug/l	NM
1.0	1,2,3-Trichlorobenzene	1.0 U	ug/l	NM
1.0	1,2,4-Trichlorobenzene	1.0 U	ug/l	NM
1.0	1,1,1-Trichloroethane	1.0 U	ug/l	NM
1.0	1,1,2-Trichloroethane	1.0 U	ug/l	NM
1.0	Trichloroethene	1.0 U	ug/l	NM
1.0	Trichlorofluoromethane	1.0 U	ug/l	NM
1.0	1,2,3-Trichloropropane	1.0 U	ug/l	NM
1.0	1,2,4-Trimethylbenzene	1.0 U	ug/l	NM

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand/NAS Key West  
PROJECT NUMBER: 7586/CTO-0031  
DATE RECEIVED: 08/26/1998  
ANALYTICAL PROTOCOL: EPA 8021

Lab Reference Number : 98080182-4  
Client Sample ID : EQBL  
Date Sampled : 08/25/1998  
Date Extracted : 08/27/1998  
Date Analyzed : 08/27/1998  
Sample Matrix (as Received): Water  
Analysis Confirmed : GCMS  
Dilution Factor : 1

	MDL	Analyte		Results/Flag	Units	Analyst
1.0		1,3,5-Trimethylbenzene	1.0 U	ug/l	NM	
1.0		Vinyl chloride	1.0 U	ug/l	NM	
1.0		MTBE	1.0 U	ug/l	NM	
1.0		o-Xylene	1.0 U	ug/l	NM	
1.0		m-Xylene	1.0 U	ug/l	NM	
1.0		p-Xylene	1.0 U	ug/l	NM	
		(Surr) 1,2-Dichloroethane-d4 (%)	124	%	NM	
		(Surr) Toluene-d8 (%)	126	%	NM	
		(Surr) 4-Bromofluorobenzene (%)	102	%	NM	

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 



# Quality Control Report for Method Blank

## Volatile Organics

Matrix: Water

Lab Sample ID: RB-08-27-98

QC Batch ID: 9808MS2052

Result Units: ug/l

Analysis Date: 08/27/1998

Preparation Date: 08/27/1998

Method: EPA 8021

Analyst: NM

Analyte	Result	Flag	Analyte	Result	Flag
Benzene	1.0	U	Bromobenzene	1.0	U
Bromochloromethane	1.0	U	Bromodichloromethane	1.0	U
Bromoform	1.0	U	Bromomethane	1.0	U
n-Butylbenzene	1.0	U	sec-Butylbenzene	1.0	U
tert-Butylbenzene	1.0	U	Carbon tetrachloride	1.0	U
Chlorobenzene	1.0	U	Chloroethane	1.0	U
Chloroform	1.0	U	Chloromethane	1.0	U
2-Chlorotoluene	1.0	U	4-Chlorotoluene	1.0	U
Dibromochloromethane	1.0	U	1,2-Dibromoethane	1.0	U
Dibromomethane	1.0	U	1,2-Dichlorobenzene	1.0	U
1,3-Dichlorobenzene	1.0	U	1,4-Dichlorobenzene	1.0	U
Dichlorodifluoromethane	1.0	U	1,1-Dichloroethane	1.0	U
1,2-Dichloroethane	1.0	U	1,1-Dichloroethene	1.0	U
cis-1,2-Dichloroethene	1.0	U	trans-1,2-Dichloroethene	1.0	U
1,2-Dichloropropane	1.0	U	1,3-Dichloropropane	1.0	U
2,2-Dichloropropane	1.0	U	1,1-Dichloropropene	1.0	U
1,3-Dichloropropene (cis)	1.0	U	1,3-Dichloropropene (trans)	1.0	U
Ethylbenzene	1.0	U	Hexachlorobutadiene	1.0	U
Isopropylbenzene	1.0	U	p-Isopropyltoluene	1.0	U
Methylene chloride	6.0		Naphthalene	1.0	U
n-Propylbenzene	1.0	U	Styrene	1.0	U
1,1,1,2-Tetrachloroethane	1.0	U	1,1,2,2-Tetrachloroethane	1.0	U
Tetrachloroethene	1.0	U	Toluene	1.0	U
1,2,3-Trichlorobenzene	1.0	U	1,2,4-Trichlorobenzene	1.0	U
1,1,1-Trichloroethane	1.0	U	1,1,2-Trichloroethane	1.0	U
Trichloroethene	1.0	U	Trichlorofluoromethane	1.0	U
1,2,3-Trichloropropane	1.0	U	1,2,4-Trimethylbenzene	1.0	U
1,3,5-Trimethylbenzene	1.0	U	Vinyl chloride	1.0	U
MTBE	1.0	U	o-Xylene	1.0	U
m-Xylene	1.0	U	p-Xylene	1.0	U
(Surr) 1,2-Dichloroethane-d4 (%)	102.0		(Surr) Toluene-d8 (%)	126.0	
(Surr) 4-Bromofluorobenzene (%)	97.0				

# Quality Control Report for LCS Analysis

## Volatile Organics

Matrix: Water

Lab Sample ID: LCS

QC Batch ID: 9808MS2052

LCS Units: ug/l

Analysis Date: 08/27/1998

Preparation Date: 08/27/1998

Method: EPA 8021

Analyst: NM

Analyte	LCS Conc	LCS Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Benzene	50.0	47.0	94	75	120
Carbon tetrachloride	50.0	51.0	102	75	120
Chlorobenzene	50.0	50.0	100	75	120
1,4-Dichlorobenzene	50.0	47.0	94	75	120
1,1-Dichloroethene	50.0	58.0	116	75	120
Ethylbenzene	50.0	52.0	104	75	120
Toluene	50.0	48.0	96	75	120
Trichloroethene	50.0	56.0	112	75	120

# Quality Control Report for Spike/Spike Duplicate Analysis

## Volatile Organics

Matrix: Water

Lab Sample ID: MW-QC

QC Batch ID: 9808MS2052

Spike Units: ug/l

Analysis Date: 08/27/1998

Preparation Date: 08/27/1998

Method: EPA 8021

Analyst: NM

Analyte	Spike Amount	Sample Result	Spike Result	Spike Percent Recovery	MSD Result	MSD Percent Recovery	RPD
Benzene	50.0	0.0	49.0	98	51.0	102	4
Carbon tetrachloride	50.0	0.0	51.0	102	52.0	104	2
Chlorobenzene	50.0	0.0	51.0	102	51.0	102	0
1,4-Dichlorobenzene	50.0	0.0	49.0	98	50.0	100	2
1,1-Dichloroethene	50.0	0.0	58.0	116	57.0	114	2
Ethylbenzene	50.0	0.0	55.0	110	54.0	108	2
Toluene	50.0	0.0	54.0	108	50.0	100	8
Trichloroethene	50.0	0.0	55.0	110	55.0	110	0

### Quality Control Limits

Analyte	Lower Limit	Upper Limit	RPD
Benzene	57	146	15
Carbon tetrachloride	67	135	11
Chlorobenzene	67	128	10
1,4-Dichlorobenzene	72	134	10
1,1-Dichloroethene	76	125	8
Ethylbenzene	75	127	9
Toluene	64	131	11
Trichloroethene	75	122	8

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Polynuclear Aromatic Hydrocarb

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand/NAS Key West  
PROJECT NUMBER: 7586/CTO-0031  
DATE RECEIVED: 08/26/1998  
ANALYTICAL PROTOCOL: EPA 8100

Lab Reference Number : 98080182-1  
Client Sample ID : A902-SB41-03  
Date Sampled : 08/25/1998  
Date Extracted : 08/28/1998  
Date Analyzed : 08/28/1998  
Sample Matrix (as Received): Soil  
Analysis Confirmed : No  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
100	Acenaphthene	100 U	ug/kg	ELA
100	Acenaphthylene	100 U	ug/kg	ELA
100	Anthracene	100 U	ug/kg	ELA
100	Benzo(a)anthracene	100 U	ug/kg	ELA
100	Benzo(a)pyrene	100 U	ug/kg	ELA
100	Benzo(b)fluoranthene	100 U	ug/kg	ELA
100	Benzo(ghi)perylene	100 U	ug/kg	ELA
100	Benzo(k)fluoranthene	100 U	ug/kg	ELA
100	Chrysene	100 U	ug/kg	ELA
100	Dibenzo(ah)anthracene	100 U	ug/kg	ELA
100	Fluoranthene	100 U	ug/kg	ELA
100	Fluorene	100 U	ug/kg	ELA
100	Indeno(123-cd)pyrene	100 U	ug/kg	ELA
100	Naphthalene	100 U	ug/kg	ELA
100	1-Methyl naphthalene	100 U	ug/kg	ELA
100	2-Methyl naphthalene	100 U	ug/kg	ELA
100	Phenanthrene	100 U	ug/kg	ELA
100	Pyrene	100 U	ug/kg	ELA
	(Surr) 2-Fluorobiphenyl (%)	72	%	ELA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Polynuclear Aromatic Hydrocarb

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand/NAS Key West  
PROJECT NUMBER: 7586/CTO-0031  
DATE RECEIVED: 08/26/1998  
ANALYTICAL PROTOCOL: EPA 8100

Lab Reference Number : 98080182-2  
Client Sample ID : A902-SB42-02  
Date Sampled : 08/25/1998  
Date Extracted : 08/28/1998  
Date Analyzed : 08/28/1998  
Sample Matrix (as Received): Soil  
Analysis Confirmed : Yes  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
100	Acenaphthene	100 U	ug/kg	ELA
100	Acenaphthylene	100 U	ug/kg	ELA
100	Anthracene	100 U	ug/kg	ELA
100	Benzo(a)anthracene	495	ug/kg	ELA
100	Benzo(a)pyrene	460	ug/kg	ELA
100	Benzo(b)fluoranthene	595	ug/kg	ELA
100	Benzo(ghi)perylene	395	ug/kg	ELA
100	Benzo(k)fluoranthene	230	ug/kg	ELA
100	Chrysene	460	ug/kg	ELA
100	Dibenzo(ah)anthracene	100 U	ug/kg	ELA
100	Fluoranthene	1250	ug/kg	ELA
100	Fluorene	100 U	ug/kg	ELA
100	Indeno(123-cd)pyrene	330	ug/kg	ELA
100	Naphthalene	100 U	ug/kg	ELA
100	1-Methyl naphthalene	100 U	ug/kg	ELA
100	2-Methyl naphthalene	100 U	ug/kg	ELA
100	Phenanthrene	860	ug/kg	ELA
100	Pyrene	100 U	ug/kg	ELA
	(Surr) 2-Fluorobiphenyl (%)	66	%	ELA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRs Certification # E83239/83353

Reviewed by : 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Polynuclear Aromatic Hydrocarb

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand/NAS Key West  
PROJECT NUMBER: 7586/CTO-0031  
DATE RECEIVED: 08/26/1998  
ANALYTICAL PROTOCOL: EPA 8100

Lab Reference Number : 98080182-3  
Client Sample ID : A902-SB43-02  
Date Sampled : 08/25/1998  
Date Extracted : 08/28/1998  
Date Analyzed : 08/28/1998  
Sample Matrix (as Received): Soil  
Analysis Confirmed : No  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
100	Acenaphthene	100 U	ug/kg	ELA
100	Acenaphthylene	100 U	ug/kg	ELA
100	Anthracene	100 U	ug/kg	ELA
100	Benzo(a)anthracene	100 U	ug/kg	ELA
100	Benzo(a)pyrene	100 U	ug/kg	ELA
100	Benzo(b)fluoranthene	100 U	ug/kg	ELA
100	Benzo(ghi)perylene	100 U	ug/kg	ELA
100	Benzo(k)fluoranthene	100 U	ug/kg	ELA
100	Chrysene	100 U	ug/kg	ELA
100	Dibenzo(ah)anthracene	100 U	ug/kg	ELA
100	Fluoranthene	100 U	ug/kg	ELA
100	Fluorene	100 U	ug/kg	ELA
100	Indeno(123-cd)pyrene	100 U	ug/kg	ELA
100	Naphthalene	100 U	ug/kg	ELA
100	1-Methyl naphthalene	100 U	ug/kg	ELA
100	2-Methyl naphthalene	100 U	ug/kg	ELA
100	Phenanthrene	100 U	ug/kg	ELA
100	Pyrene	100 U	ug/kg	ELA
	(Surr) 2-Fluorobiphenyl (%)	83	%	ELA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

# Quality Control Report for Method Blank

## Polynuclear Aromatic Hydrocarbons

Matrix: Soil

Lab Sample ID: RB-08-28-98

QC Batch ID: 9808PAH106

Result Units: ug/kg

Analysis Date: 08/28/1998

Preparation Date: 08/28/1998

Method: EPA 8100

Analyst: ELA

Analyte	Result	Flag	Analyte	Result	Flag
Acenaphthene	100	U	Acenaphthylene	100	U
Anthracene	100	U	Benzo(a)anthracene	100	U
Benzo(a)pyrene	100	U	Benzo(b)fluoranthene	100	U
Benzo(ghi)perylene	100	U	Benzo(k)fluoranthene	100	U
Chrysene	100	U	Dibenzo(ah)anthracene	100	U
Fluoranthene	100	U	Fluorene	100	U
Indeno(123-cd)pyrene	100	U	Naphthalene	100	U
1-Methyl naphthalene	100	U	2-Methyl naphthalene	100	U
Phenanthrene	100	U	Pyrene	100	U
(Surr) 2-Fluorobiphenyl (%)	87				

# Quality Control Report for LCS/LCS Duplicate Analysis

## Polynuclear Aromatic Hydrocarbons

Matrix: Soil

Lab Sample ID: LCS

QC Batch ID: 9808PAH106

LCS Units: ug/kg

Analysis Date: 08/28/1998

Preparation Date: 08/28/1998

Method: EPA 8100

Analyst: ELA

Analyte	LCS Conc		LCS Result	LCS Percent Recovery	LCSD Result	LCSD Percent Recovery	RPD
(Surr) 2-Fluorobiphenyl	100	0	80	80	80	80	0
Acenaphthene	50	0	49	98	49	98	0
Acenaphthylene	50	0	39	78	39	78	0
Anthracene	50	0	48	96	50	100	4
Benzo(a)anthracene	50	0	35	70	35	70	0
Benzo(a)pyrene	50	0	38	76	35	70	8
Benzo(b)fluoranthene	50	0	40	80	40	80	0
Benzo(ghi)perylene	50	0	39	78	40	80	3
Benzo(k)fluoranthene	50	0	40	80	40	80	0
Chrysene	50	0	35	70	35	70	0
Dibenzo(ah)anthracene	50	0	41	82	41	82	0
Fluoranthene	50	0	42	84	44	88	5
Fluorene	50	0	40	80	42	84	5
Indeno(123-cd)pyrene	50	0	41	82	41	82	0
Naphthalene	50	0	36	72	36	72	0
Phenanthrene	50	0	38	76	42	84	10
Pyrene	50	0	42	84	44	88	5

### Quality Control Limits

Analyte	Lower Limit	Upper Limit	RPD
SS_2-Fluorobiphenyl	51	100	11
Acenaphthene	62	125	11
Acenaphthylene	55	100	9
Anthracene	64	128	11
Benzo(a)anthracene	54	110	11
Benzo(a)pyrene	56	114	11
Benzo(b)fluoranthene	53	119	13
Benzo(ghi)perylene	50	112	13
Benzo(k)fluoranthene	53	119	13
Chrysene	53	114	12
Dibenzo(ah)anthracene	51	116	13
Fluoranthene	58	110	10
Fluorene	54	107	11
Indeno(123-cd)pyrene	51	115	13
Naphthalene	53	94	9
Phenanthrene	53	112	12
Pyrene	60	111	10



# Quality Control Report for Spike/Spike Duplicate Analysis

## Polynuclear Aromatic Hydrocarbons

Matrix: Soil

Lab Sample ID: 9808142-2

QC Batch ID: 9808PAH106

Spike Units: ug/kg

Analysis Date: 08/28/1998

Preparation Date: 08/28/1998

Method: EPA 8100

Analyst: ELA

Analyte	Spike Amount	Sample Result	Spike Result	Spike Percent Recovery	MSD Result	MSD Percent Recovery	RPD
(Surr) 2-Fluorobiphenyl	100	0	56	56	56	56	0
Acenaphthene	50	0	56	112	56	112	0
Acenaphthylene	50	0	45	90	45	90	0
Anthracene	50	0	56	112	59	118	5
Benzo(a)anthracene	50	0	38	76	40	80	5
Benzo(a)pyrene	50	0	48	96	45	90	6
Benzo(b)fluoranthene	50	0	39	78	37	74	5
Benzo(ghi)perylene	50	0	34	68	34	68	0
Benzo(k)fluoranthene	50	0	39	78	37	74	5
Chrysene	50	0	36	72	36	72	0
Dibenzo(ah)anthracene	50	0	35	70	33	66	6
Fluoranthene	50	0	50	100	51	102	2
Fluorene	50	0	47	94	47	94	0
Indeno(123-cd)pyrene	50	0	35	70	33	66	6
Naphthalene	50	0	41	82	41	82	0
Phenanthrene	50	0	47	94	48	96	2
Pyrene	50	0	50	100	50	100	0

### Quality Control Limits

Analyte	Lower Limit	Upper Limit	RPD
SS_2-Fluorobiphenyl	45	101	13
Acenaphthene	46	125	15
Acenaphthylene	42	105	14
Anthracene	53	132	14
Benzo(a)anthracene	41	121	16
Benzo(a)pyrene	45	119	15
Benzo(b)fluoranthene	44	125	16
Benzo(ghi)perylene	37	120	18
Benzo(k)fluoranthene	44	126	16
Chrysene	48	117	14
Dibenzo(ah)anthracene	39	123	17
Fluoranthene	49	118	14
Fluorene	44	112	14
Indeno(123-cd)pyrene	36	124	18
Naphthalene	38	102	15
Phenanthrene	45	118	15
Pyrene	49	120	14

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

PAH's by HPLC

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand/NAS Key West  
PROJECT NUMBER: 7586/CTO-0031  
DATE RECEIVED: 08/26/1998  
ANALYTICAL PROTOCOL: EPA 8310

Lab Reference Number : 98080182-4  
Client Sample ID : EQBL  
Date Sampled : 08/25/1998  
Date Extracted : 08/31/1998  
Date Analyzed : 09/01/1998  
Sample Matrix (as Received): Water  
Analysis Confirmed : GCMS  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
5	Acenaphthene	5 U	ug/l	DC
5	Acenaphthylene	5 U	ug/l	DC
5	Anthracene	5 U	ug/l	DC
0.2	Benzo(a)anthracene	0.2 U	ug/l	DC
0.25	Benzo(a)pyrene	0.25 U	ug/l	DC
0.2	Benzo(b)fluoranthene	0.2 U	ug/l	DC
0.2	Benzo(ghi)perylene	0.2 U	ug/l	DC
0.25	Benzo(k)fluoranthene	0.25 U	ug/l	DC
0.01	Chrysene	0.01 U	ug/l	DC
0.2	dibenzo(ah)anthracene	0.2 U	ug/l	DC
0.01	Fluoranthene	0.01 U	ug/l	DC
0.01	Fluorene	0.01 U	ug/l	DC
0.10	Indeno(123cd)pyrene	0.10 U	ug/l	DC
0.05	Naphthalene	0.05 U	ug/l	DC
0.05	1-Methyl naphthalene	0.05 U	ug/l	DC
0.05	2-Methyl naphthalene	0.05 U	ug/l	DC
0.025	Phenanthrene	0.025 U	ug/l	DC
0.025	Pyrene	0.025 U	ug/l	DC

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRs Certification # E83239/83353

Reviewed by : 

# Quality Control Report for Method Blank

## PAH's by HPLC

Matrix: Water

Lab Sample ID: RB-08-31

QC Batch ID: 9808PAH110

Result Units: ug/l

Analysis Date: 09/01/1998

Preparation Date: 08/31/1998

Method: EPA 8310

Analyst: DC

Analyte	Result	Flag	Analyte	Result	Flag
Acenaphthene	5	U	Acenaphthylene	5	U
Anthracene	5	U	Benzo(a)anthracene	0.2	U
Benzo(a)pyrene	0.25	U	Benzo(b)fluoranthene	0.2	U
Benzo(ghi)perylene	0.2	U	Benzo(k)fluoranthene	0.25	U
Chrysene	0.01	U	dibenzo(ah)anthracene	0.2	U
Fluoranthene	0.01	U	Fluorene	0.01	U
Indeno(123cd)pyrene	0.10	U	Naphthalene	0.05	U
1-Methyl naphthalene	0.05	U	2-Methyl naphthalene	0.05	U
Phenanthrene	0.025	U	Pyrene	0.025	U

# Quality Control Report for LCS Analysis

## PAH's by HPLC

Matrix: Water

Lab Sample ID: LCS

QC Batch ID: 9808PAH110

LCS Units: ug/l

Analysis Date: 09/01/1998

Preparation Date: 08/31/1998

Method: EPA 8310

Analyst: DC

Analyte	LCS Conc	LCS Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Acenaphthene	5	5	100	70	120
Acenaphthylene	5	4	82	70	120
Anthracene	5	5	98	70	120
Benzo(a)anthracene	5.0	5.1	102	70	120
Benzo(a)pyrene	5.00	5.50	110	70	120
Benzo(b)fluoranthene	5.0	5.2	104	70	120
Benzo(ghi)perylene	5.0	5.3	106	70	120
Benzo(k)fluoranthene	5.00	4.20	84	70	120
Chrysene	5.00	4.80	96	70	120
dibenzo(ah)anthracene	5.0	4.4	88	70	120
Fluoranthene	5.00	5.10	102	70	120
Fluorene	5.00	4.80	96	70	120
Indeno(123cd)pyrene	5.00	5.10	102	70	120
Naphthalene	5.00	4.80	96	70	120
Phenanthrene	5.000	4.800	96	70	120
Pyrene	5.000	5.300	106	70	120

# Quality Control Report for Spike Analysis

## PAH's by HPLC

Matrix: Water

Lab Sample ID: 98080119-1

QC Batch ID: 9808PAH110

Spike Units: ug/l

Analysis Date: 09/01/1998

Preparation Date: 08/31/1998

Method: EPA 8310

Analyst: DC

Analyte	Spike Amount	Sample Result	Spike Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Acenaphthene	5	0	5	108	60	133
Acenaphthylene	5	0	4	81	60	133
Anthracene	5	0	5	104	60	133
Benzo(a)anthracene	5.0	0.0	5.7	114	60	133
Benzo(a)pyrene	5.00	0.00	6.10	122	60	133
Benzo(b)fluoranthene	5.0	0.0	5.8	116	60	133
Benzo(ghi)perylene	5.0	0.0	5.9	118	60	133
Benzo(k)fluoranthene	5.00	0.00	4.70	94	60	133
Chrysene	5.00	0.00	5.30	106	60	133
dibenzo(ah)anthracene	5.0	0.0	4.9	98	60	133
Fluoranthene	5.00	0.00	5.70	114	60	133
Fluorene	5.00	0.00	4.90	98	60	133
Indeno(123cd)pyrene	5.00	0.00	5.60	112	60	133
Naphthalene	5.00	0.00	3.70	74	60	133
Phenanthrene	5.000	0.000	5.200	104	60	133
Pyrene	5.000	0.000	5.900	118	60	133

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Petroleum Hydrocarbons

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand/NAS Key West  
PROJECT NUMBER: 7586/CTO-0031  
DATE RECEIVED: 08/26/1998  
ANALYTICAL PROTOCOL: FL-PRO

Lab Reference Number : 98060182-1  
Client Sample ID : A902-SB41-03  
Date Sampled : 08/25/1998  
Date Extracted : 08/28/1998  
Date Analyzed : 08/28/1998  
Sample Matrix (as Received): Soil  
Analysis Confirmed : No  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
4.0	Total PHS	4.0 U	mg/kg	ELA
	(Surr) C-39 (%)	79	%	ELA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by :



PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Petroleum Hydrocarbons

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand/NAS Key West  
PROJECT NUMBER: 7586/CTO-0031  
DATE RECEIVED: 08/26/1998  
ANALYTICAL PROTOCOL: FL-PRO

Lab Reference Number : 98080182-2  
Client Sample ID : A902-SB42-02  
Date Sampled : 08/25/1998  
Date Extracted : 08/28/1998  
Date Analyzed : 08/28/1998  
Sample Matrix (as Received): Soil  
Analysis Confirmed : No  
Dilution Factor : 10

MDL	Analyte	Results/Flag	Units	Analyst
40.0	Total PHS	490	mg/kg	ELA
	(Surr) C-39 (%)	0 DL	%	ELA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Petroleum Hydrocarbons

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand/NAS Key West  
PROJECT NUMBER: 7586/CTO-0031  
DATE RECEIVED: 08/26/1998  
ANALYTICAL PROTOCOL: FL-PRO

Lab Reference Number : 98080182-3  
Client Sample ID : A902-SB43-02  
Date Sampled : 08/25/1998  
Date Extracted : 08/28/1998  
Date Analyzed : 08/28/1998  
Sample Matrix (as Received): Soil  
Analysis Confirmed : No  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
4.0	Total PHS	4.0 U	mg/kg	ELA
	(Surr) C-39 (%)	78	%	ELA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRs Certification # E83239/83353

Reviewed by : 



# Quality Control Report for Method Blank

## INORGANICS

Analyte	Units	Result	Flag	QC Batch ID	Analyst
Method: FL-PRO Total PHS	QC Batch: 9808FLRO102 mg/kg	Sample ID: RB-08-28-98 4.0	Date Prep: 08/28/1998 U	Date Anal: 08/28/1998 9808FLRO102	Analyst: ELA ELA
Method: FL-PRO (Surr) C-39 (%)	QC Batch: 9808FLRO102 %	Sample ID: RB-08-28-98 83.0	Date Prep: 08/28/1998	Date Anal: 08/28/1998 9808FLRO102	Analyst: ELA ELA

# Quality Control Report for LCS/LCS Duplicate Analysis

## INORGANICS

Analyte		LCS Conc		LCS Result	Percent Recovery	LCSD Result	Percent Recovery	RPD
Method: FL-PRO SS_C-39	QC Batch: 9808FLRO102	Sample ID: LCS 100.0 mg/kg	Date Prep: 08/28/1998	Date Anal: 08/28/1998	Analyst: ELA			
				90.0	90	91.0	91	1
Method: FL-PRO Total PHS	QC Batch: 9808FLRO102	Sample ID: LCS 5.0 mg/kg	Date Prep: 08/28/1998	Date Anal: 08/28/1998	Analyst: ELA			
				3.8	76	3.7	74	3

Quality Control Limits			
Analyte	Lower Limit	Upper Limit	RPD
SS_C-39	0	145	33
Total PHS	55	110	11

# Quality Control Report for Spike/Spike Duplicate Analysis

## INORGANICS

Analyte		Spike Amount	Sample Result	Spike Result	Percent Recovery	MSD Result	Percent Recovery	RPD
Method: FL-PRO SS_C-39	QC Batch: 9808FLRO102	Sample ID: 9808142-2 100.0 mg/kg	Date Prep: 08/28/1998 0.0	Date Anal: 08/28/1998 104.0	104	Analyst: ELA 103.0	103	1
Method: FL-PRO Total PHS	QC Batch: 9808FLRO102	Sample ID: 9808142-2 5.0 mg/kg	Date Prep: 08/28/1998 0.0	Date Anal: 08/28/1998 4.4	88	Analyst: ELA 4.6	92	4

### Quality Control Limits

Analyte	Lower Limit	Upper Limit	RPD
SS_C-39	5	141	33
Total PHS	54	111	12

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Petroleum Hydrocarbons

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand/NAS Key West  
PROJECT NUMBER: 7586/CTO-0031  
DATE RECEIVED: 08/26/1998  
ANALYTICAL PROTOCOL: FL-PRO

Lab Reference Number : 98080182-4  
Client Sample ID : EQBL  
Date Sampled : 08/25/1998  
Date Extracted : 08/28/1998  
Date Analyzed : 08/28/1998  
Sample Matrix (as Received): Water  
Analysis Confirmed : No  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
0.1	Total PHS	0.1 U	mg/l	ELA
	(Surr) C-39 (%)	103	%	ELA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

# Quality Control Report for Method Blank

## Petroleum Hydrocarbons

Matrix: Water

Lab Sample ID: RB-08-28-98

QC Batch ID: 9808FLRO099

Result Units: mg/l

Analysis Date: 08/28/1998

Preparation Date: 08/28/1998

Method: FL-PRO

Analyst: ELA

Analyte	Result	Flag	Analyte	Result	Flag
Total PHS	0.1	U	(Surr) C-39 (%)	83.0	

# Quality Control Report for LCS/LCS Duplicate Analysis

## Petroleum Hydrocarbons

Matrix: Water

Lab Sample ID: LCS

QC Batch ID: 9808FLRO099

LCS Units: mg/l

Analysis Date: 08/28/1998

Preparation Date: 08/28/1998

Method: FL-PRO

Analyst: ELA

Analyte	LCS Conc		LCS Result	LCS Percent Recovery	LCSD Result	LCSD Percent Recovery	RPD
(Surr) C-39	100.0	0.0	90.0	90	91.0	91	1
Total PHS	5.0	0.0	3.6	72	3.7	74	3

Quality Control Limits			
Analyte	Lower Limit	Upper Limit	RPD
SS_C-39	4	140	31
Total PHS	57	110	11

# Quality Control Report for Spike Analysis

## Petroleum Hydrocarbons

Matrix: Water

Lab Sample ID: 9808178-1

QC Batch ID: 9808FLRO099

Spike Units: mg/l

Analysis Date: 08/28/1998

Preparation Date: 08/28/1998

Method: FL-PRO

Analyst: ELA

Analyte	Spike Amount	Sample Result	Spike Result	Percent Recovery	Lower Control Limit	Upper Control Limit
(Surr) C-39	100.0	0.0	70.0	70	7	139
Total PHS	5.0	0.0	4.0	80	57	110

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194

Report of Analysis

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand/NAS Key West  
PROJECT NUMBER: 7586/CTO-0031  
DATE RECEIVED: 08/26/1998

Lab Reference Number : 98080182-1  
Client Sample ID : A902-SB41-03  
Date Sampled : 08/25/1998  
Sample Matrix (as Received): Soil

Method	Parameter	Results/Flag	Units	Analyst	Date Prep	Date Anal	MDL
EPA 415.1	Total Organic Carbon	150	mg/kg	LAB	08/28/1998	08/28/1998	10

U = Undetected. The value preceeding the 'U' is the MDL for the analyte. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by :



PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194

Report of Analysis

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand/NAS Key West  
PROJECT NUMBER: 7586/CTO-0031  
DATE RECEIVED: 08/26/1998

Lab Reference Number : 98080182-2  
Client Sample ID : A902-SB42-02  
Date Sampled : 08/25/1998  
Sample Matrix (as Received): Soil

Method	Parameter	Results/Flag	Units	Analyst	Date Prep	Date Anal	MDL
EPA 415.1	Total Organic Carbon	125	mg/kg	LAB	08/28/1998	08/28/1998	10

U = Undetected. The value preceeding the 'U' is the MDL for the analyte. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRs Certification # E83239/83353

Reviewed by : 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194

Report of Analysis

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand/NAS Key West  
PROJECT NUMBER: 7586/CTO-0031  
DATE RECEIVED: 08/26/1998

Lab Reference Number : 98080182-3  
Client Sample ID : A902-SB43-02  
Date Sampled : 08/25/1998  
Sample Matrix (as Received): Soil

Method	Parameter	Results/Flag	Units	Analyst	Date Prep	Date Anal	MDL
EPA 415.1	Total Organic Carbon	96	mg/kg	LAB	08/28/1998	08/28/1998	10

U = Undetected. The value preceeding the 'U' is the MDL for the analyte. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by :

# PC&B Environmental

210 Park Road, Oviedo, FL 32765  
407-359-7194 (FAX) 407-359-7197

10945

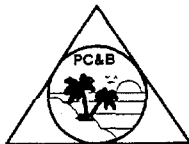
## Chain of Custody

Work Order: 9808182  
Date: 8/25/98 Page 1 of 1

COMPANY: <u>TETRA TECH NUS</u> ADDRESS: <u>1311 Executive Center Dr., #220</u> <u>Tallahassee, FL 32303</u> SAMPLED BY: <u>POB</u> SIGN: <u>[Signature]</u> PHONE: _____ FAX: _____				ANALYSIS REQUESTED												Number of Containers							
				<div style="display: flex; justify-content: space-between;"> <div> <u>EMCULE</u> <u>VOC/8021</u> <u>TOL</u> <u>PC</u> <u>FLA</u> <u>PRO/8310</u> <u>PC</u> </div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div>																			
#	SAMPLE ID	DATE/TIME	AIR	MATRIX WATER SLUDGE	SOIL SOLID	ORG. LIQUID	PRESERVATION																
1	A90Z-S641-03	8/25/98 1545			✓		3/1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1
2	A90Z-S642-02	8/25/98 1618			✓		3/1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	
3	A90Z-S643-02	8/25/98 1645			✓		3/1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	
4	EQBL	8/25/98 1645	✓				2/1	PC	1	1	1	1	1	1	1		1	1	1	1	1	1	
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							
13																							

RELINQUISHED BY		DATE/TIME	RECEIVED BY		DATE/TIME	PROJECT INFORMATION		SAMPLE RECEIPT	
1:	<u>POB</u>	<u>6/17/98</u>	1:	<u>[Signature]</u>	<u>8/22/98</u>	PROJECT NAME: <u>Truck Fill stand/NAS Key West</u>		Total # of Containers	<u>22</u>
2:			2:	<u>POB</u>	<u>8/26/98</u>	PROJECT #: <u>7586 / CTO-0068 0031</u>		Chain of Custody Seals	<u>N/A</u>
3:			3:		<u>9:50</u>	SITE ADDRESS: <u>Boca Chica Airfield/NAS Key West</u>		Recv'd in Good Condition	
SPECIAL INSTRUCTIONS/COMMENTS: <u>Kept on ice 40 C</u>						PROJECT MANAGER: <u>Paul Calligan</u>		PO #:	
						INVOICE TO: (IF DIFFERENT FROM ABOVE)			

QUOTE/CONT #:



## PC&B Environmental Laboratories, Inc.

210 Park Road, Oviedo, Florida 32765  
Phone: 407-359-7194 Fax: 407-359-7197

02-09-1999

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

Dear Paul Calligan:

Enclosed are the results of the analysis of your samples received 01/29/1999.

Our laboratory is certified by the Florida DHRS (Lab #E83239) and operates under an FDEP approved Comprehensive Quality Assurance Plan (#900134G). Unless otherwise noted, all results are reported as received. All data were determined in accordance with published procedures (EPA-600/4-79-020), Methods for Chemical Analysis of Water and Wastes, Revised March 1983 and/or Standard Methods for the examination of Water and Wastewater, 18th Edition 1989 and/or Test Methods for Evaluating Solid Waste (EPA-SW-846, Revised January 1995), unless stated otherwise in our CompQapp under method modifications.

If you have any questions, please do not hesitate to give me a call.

Sincerely,

Beckie J. Burdick  
Laboratory Manager



# PC&B Environmental Laboratories, Inc.

210 Park Road, Oviedo, Florida 32765  
Phone: 407-359-7194 Fax: 407-359-7197

Client : Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

Contact : Paul Calligan  
Phone : (850) 656-5458

**Laboratory Reference Number : 99010242**

Project Name : NAS KEY WEST

Project Number :

Chain of Custody : 10107

Sample temperature at time of receipt: 4 degrees C

Laboratory ID	Matrix	Client ID	Status	Date/Time Sampled
99010242-1	Sediment	A902-SD-01	RUN	01/28/1999 15:10
99010242-2	Water	TRIP BLANK	RUN	01/28/1999 15:10

Number	Parameter	Description
1	FL-PRO	Petroleum Hydrocarbons
1	EPA 8100	Polynuclear Aromatic Hydrocarbons
1	EPA 8021	Volatile Organics
1	EPA 8021	Volatile Organics
1	EPA 6010	Lead by ICAP

# PC&B Environmental Laboratories, Inc.

210 Park Road  
Oviedo, FL 32765  
407-359-7194 - (FAX) 359-7197

## Case Narrative

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

CASE NARRATIVE for Work Order: 99010242

Project Number:

Project Name: NAS KEY WEST

This Case Narrative is a summary of events and/or problems encountered with this Work Order.

For samples requesting EPA 601/602/8010/8020/8021 analysis, the GCMS method EPA 624/8260 was substituted in order to generate the highest quality data possible at no additional cost.

### Definition of Flags

DL	=	No surrogate result due to dilution or matrix interference.
J	=	Estimated Value, value not accurate.
L	=	Off-scale high. Actual value is greater than value given.
Q	=	Sample held beyond the accepted holding time.
T	=	Value reported is less than the laboratory method detection limit.
V	=	Analyte was both detected in the method blank and sample.

## QC Batch Summary

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

QC BATCH SUMMARY for Work Order: 99010242  
Project Number:  
Project Name: NAS KEY WEST

Method	SubNum	QC Batch
EPA 6010 - Lead by ICAP		
	-1	9902RC032
FL-PRO - Petroleum Hydrocarbons		
	-1	9902FLRO015
EPA 8100 - Polynuclear Aromatic Hydrocarbons		
	-1	9902PAH014
EPA 8021 - Volatile Organics		
	-1	9901MS2069
EPA 8021 - Volatile Organics		
	-2	9901MS2069

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS KEY WEST  
PROJECT NUMBER:  
DATE RECEIVED: 01/29/1999  
ANALYTICAL PROTOCOL: EPA 5035/6021

Lab Reference Number : 99010242-1  
Client Sample ID : A902-SD-01  
Date Sampled : 01/28/1999  
Date Extracted : 01/29/1999  
Date Analyzed : 01/29/1999  
Percent Moisture : 85.1  
Sample Matrix (as Received): Sediment  
Analysis Confirmed : GCMS  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
5	Benzene	34 U	ug/kg	KN
5	Bromobenzene	34 U	ug/kg	KN
5	Bromochloromethane	34 U	ug/kg	KN
5	Bromodichloromethane	34 U	ug/kg	KN
5	Bromoform	34 U	ug/kg	KN
5	Bromomethane	34 U	ug/kg	KN
5	n-Butylbenzene	34 U	ug/kg	KN
5	sec-Butylbenzene	34 U	ug/kg	KN
5	tert-Butylbenzene	34 U	ug/kg	KN
5	Carbon tetrachloride	34 U	ug/kg	KN
5	Chlorobenzene	34 U	ug/kg	KN
5	Chloroethane	34 U	ug/kg	KN
5	Chloroform	34 U	ug/kg	KN
5	Chloromethane	34 U	ug/kg	KN
5	2-Chlorotoluene	34 U	ug/kg	KN
5	4-Chlorotoluene	34 U	ug/kg	KN
5	Dibromochloromethane	34 U	ug/kg	KN
5	1,2-Dibromoethane	34 U	ug/kg	KN
5	Dibromomethane	34 U	ug/kg	KN
5	1,2-Dichlorobenzene	34 U	ug/kg	KN
5	1,3-Dichlorobenzene	34 U	ug/kg	KN
5	1,4-Dichlorobenzene	34 U	ug/kg	KN
5	Dichlorodifluoromethane	34 U	ug/kg	KN
5	1,1-Dichloroethane	34 U	ug/kg	KN
5	1,2-Dichloroethane	34 U	ug/kg	KN
5	1,1-Dichloroethene	34 U	ug/kg	KN
5	cis-1,2-Dichloroethene	34 U	ug/kg	KN
5	trans-1,2-Dichloroethene	34 U	ug/kg	KN
5	1,2-Dichloropropane	34 U	ug/kg	KN
5	1,3-Dichloropropane	34 U	ug/kg	KN
5	2,2-Dichloropropane	34 U	ug/kg	KN
5	1,1-Dichloropropene	34 U	ug/kg	KN
5	Ethylbenzene	34 U	ug/kg	KN
5	Hexachlorobutadiene	34 U	ug/kg	KN
5	Isopropylbenzene	34 U	ug/kg	KN
5	p-Isopropyltoluene	34 U	ug/kg	KN
5	Methylene chloride	34 U	ug/kg	KN
5	Naphthalene	34 U	ug/kg	KN
5	n-Propylbenzene	34 U	ug/kg	KN
5	Styrene	34 U	ug/kg	KN
5	1,1,1,2-Tetrachloroethane	34 U	ug/kg	KN
5	1,1,2,2-Tetrachloroethane	34 U	ug/kg	KN
5	Tetrachloroethene	34 U	ug/kg	KN
5	Toluene	34 U	ug/kg	KN
5	1,2,3-Trichlorobenzene	34 U	ug/kg	KN
5	1,2,4-Trichlorobenzene	34 U	ug/kg	KN
5	1,1,1-Trichloroethane	34 U	ug/kg	KN
5	1,1,2-Trichloroethane	34 U	ug/kg	KN
5	Trichloroethene	34 U	ug/kg	KN
5	Trichlorofluoromethane	34 U	ug/kg	KN
5	1,2,3-Trichloropropane	34 U	ug/kg	KN
5	1,2,4-Trimethylbenzene	34 U	ug/kg	KN
5	1,3,5-Trimethylbenzene	34 U	ug/kg	KN



PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS KEY WEST  
PROJECT NUMBER:  
DATE RECEIVED: 01/29/1999  
ANALYTICAL PROTOCOL: EPA 5035/8021

Lab Reference Number : 99010242-1  
Client Sample ID : A902-SD-01  
Date Sampled : 01/28/1999  
Date Extracted : 01/29/1999  
Date Analyzed : 01/29/1999  
Percent Moisture 85.1  
Sample Matrix (as Received): Sediment  
Analysis Confirmed : GCMS  
Dilution Factor : 1

	MDL	Analyte		Results/Flag	Units	Analyst
5		Vinyl chloride	34 U	ug/kg	KN	
5		m&p-Xylenes	34 U	ug/kg	KN	
5		o-Xylene	34 U	ug/kg	KN	
5		MTBE	34 U	ug/kg	KN	
		(Surr) 1,2-Dichloroethane-d4 (%)	127	%	KN	
		(Surr) Toluene-d8 (%)	132	%	KN	
		(Surr) 4-Bromofluorobenzene (%)	127	%	KN	

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Dry Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS KEY WEST  
PROJECT NUMBER:  
DATE RECEIVED: 01/29/1999  
ANALYTICAL PROTOCOL: EPA 8021

Lab Reference Number : 99010242-2  
Client Sample ID : TRIP BLANK  
Date Sampled : 01/28/1999  
Date Extracted : 01/29/1999  
Date Analyzed : 01/29/1999  
Sample Matrix (as Received): Water  
Analysis Confirmed : GCMS  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
1.0	Benzene	1.0 U	ug/l	KN
1.0	Bromobenzene	1.0 U	ug/l	KN
1.0	Bromochloromethane	1.0 U	ug/l	KN
1.0	Bromodichloromethane	1.0 U	ug/l	KN
1.0	Bromoform	1.0 U	ug/l	KN
1.0	Bromomethane	1.0 U	ug/l	KN
1.0	n-Butylbenzene	1.0 U	ug/l	KN
1.0	sec-Butylbenzene	1.0 U	ug/l	KN
1.0	tert-Butylbenzene	1.0 U	ug/l	KN
1.0	Carbon tetrachloride	1.0 U	ug/l	KN
1.0	Chlorobenzene	1.0 U	ug/l	KN
1.0	Chloroethane	1.0 U	ug/l	KN
1.0	Chloroform	1.0 U	ug/l	KN
1.0	Chloromethane	1.0 U	ug/l	KN
1.0	2-Chlorotoluene	1.0 U	ug/l	KN
1.0	4-Chlorotoluene	1.0 U	ug/l	KN
1.0	Dibromochloromethane	1.0 U	ug/l	KN
1.0	1,2-Dibromoethane	1.0 U	ug/l	KN
1.0	Dibromomethane	1.0 U	ug/l	KN
1.0	1,2-Dichlorobenzene	1.0 U	ug/l	KN
1.0	1,3-Dichlorobenzene	1.0 U	ug/l	KN
1.0	1,4-Dichlorobenzene	1.0 U	ug/l	KN
1.0	Dichlorodifluoromethane	1.0 U	ug/l	KN
1.0	1,1-Dichloroethane	1.0 U	ug/l	KN
1.0	1,2-Dichloroethane	1.0 U	ug/l	KN
1.0	1,1-Dichloroethene	1.0 U	ug/l	KN
1.0	cis-1,2-Dichloroethene	1.0 U	ug/l	KN
1.0	trans-1,2-Dichloroethene	1.0 U	ug/l	KN
1.0	1,2-Dichloropropane	1.0 U	ug/l	KN
1.0	1,3-Dichloropropane	1.0 U	ug/l	KN
1.0	2,2-Dichloropropane	1.0 U	ug/l	KN
1.0	1,1-Dichloropropene	1.0 U	ug/l	KN
1.0	1,3-Dichloropropene (cis)	1.0 U	ug/l	KN
1.0	1,3-Dichloropropene (trans)	1.0 U	ug/l	KN
1.0	Ethylbenzene	1.0 U	ug/l	KN
1.0	Hexachlorobutadiene	1.0 U	ug/l	KN
1.0	Isopropylbenzene	1.0 U	ug/l	KN
1.0	p-Isopropyltoluene	1.0 U	ug/l	KN
1.0	Methylene chloride	3.4 V	ug/l	KN
1.0	Naphthalene	1.0 U	ug/l	KN
1.0	n-Propylbenzene	1.0 U	ug/l	KN
1.0	Styrene	1.0 U	ug/l	KN
1.0	1,1,1,2-Tetrachloroethane	1.0 U	ug/l	KN
1.0	1,1,2,2-Tetrachloroethane	1.0 U	ug/l	KN
1.0	Tetrachloroethene	1.0 U	ug/l	KN
1.0	Toluene	1.0 U	ug/l	KN
1.0	1,2,3-Trichlorobenzene	1.0 U	ug/l	KN
1.0	1,2,4-Trichlorobenzene	1.0 U	ug/l	KN
1.0	1,1,1-Trichloroethane	1.0 U	ug/l	KN
1.0	1,1,2-Trichloroethane	1.0 U	ug/l	KN
1.0	Trichloroethene	1.0 U	ug/l	KN
1.0	Trichlorofluoromethane	1.0 U	ug/l	KN
1.0	1,2,3-Trichloropropane	1.0 U	ug/l	KN
1.0	1,2,4-Trimethylbenzene	1.0 U	ug/l	KN

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS KEY WEST  
PROJECT NUMBER:  
DATE RECEIVED: 01/29/1999  
ANALYTICAL PROTOCOL: EPA 8021

Lab Reference Number : 99010242-2  
Client Sample ID : TRIP BLANK  
Date Sampled : 01/28/1999  
Date Extracted : 01/29/1999  
Date Analyzed : 01/29/1999  
Sample Matrix (as Received): Water  
Analysis Confirmed : GCMS  
Dilution Factor : 1

	MDL	Analyte		Results/Flag	Units	Analyst
1.0		1,3,5-Trimethylbenzene	1.0 U	ug/l	KN	
1.0		Vinyl chloride	1.0 U	ug/l	KN	
1.0		MTBE	1.0 U	ug/l	KN	
1.0		o-Xylene	1.0 U	ug/l	KN	
1.0		m-Xylene	1.0 U	ug/l	KN	
1.0		p-Xylene	1.0 U	ug/l	KN	
		(Surr) 1,2-Dichloroethane-d4 (%)	111	%	KN	
		(Surr) Toluene-d8 (%)	111	%	KN	
		(Surr) 4-Bromofluorobenzene (%)	141	%	KN	

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

# Quality Control Report for Spike/Spike Duplicate Analysis

## Volatile Organics

Matrix: Soil

Lab Sample ID: 9901213-2

QC Batch ID: 9901MS2069

Spike Units: ug/kg

Analysis Date: 01/29/1999

Preparation Date: 01/29/1999

Method: EPA 8021

Analyst: KN

Analyte	Spike Amount	Sample Result	Spike Result	Spike Percent Recovery	MSD Result	MSD Percent Recovery	RPD
Benzene	50	0	55	110	53	106	4
Carbon tetrachloride	50	0	50	100	50	100	0
Chlorobenzene	50	0	52	104	52	104	0
1,4-Dichlorobenzene	50	0	51	102	52	104	2
1,1-Dichloroethene	50	0	56	112	53	106	6
Ethylbenzene	50	0	49	98	50	100	2
Toluene	50	0	46	92	45	90	2
Trichloroethene	50	0	52	104	54	108	4

### Quality Control Limits

Analyte	Lower Limit	Upper Limit	RPD
Benzene	59	144	18
Carbon tetrachloride	49	148	15
Chlorobenzene	67	130	18
1,4-Dichlorobenzene	56	141	18
1,1-Dichloroethene	52	150	18
Ethylbenzene	42	157	19
Toluene	54	136	19
Trichloroethene	59	160	18

# Quality Control Report for Method Blank

## Volatile Organics

Matrix: Soil  
Lab Sample ID: RB-1-29-99  
QC Batch ID: 9901MS2069  
Result Units: ug/kg

Analysis Date: 01/29/1999  
Preparation Date: 01/29/1999  
Method: EPA 8021  
Analyst: KN

Analyte	Result	Flag	Analyte	Result	Flag
Benzene	5	U	Bromobenzene	5	U
Bromochloromethane	5	U	Bromodichloromethane	5	U
Bromoform	5	U	Bromomethane	5	U
n-Butylbenzene	5	U	sec-Butylbenzene	5	U
tert-Butylbenzene	5	U	Carbon tetrachloride	5	U
Chlorobenzene	5	U	Chloroethane	5	U
Chloroform	5	U	Chloromethane	5	U
2-Chlorotoluene	5	U	4-Chlorotoluene	5	U
Dibromochloromethane	5	U	1,2-Dibromoethane	5	U
Dibromomethane	5	U	1,2-Dichlorobenzene	5	U
1,3-Dichlorobenzene	5	U	1,4-Dichlorobenzene	5	U
Dichlorodifluoromethane	5	U	1,1-Dichloroethane	5	U
1,2-Dichloroethane	5	U	1,1-Dichloroethene	5	U
cis-1,2-Dichloroethene	5	U	trans-1,2-Dichloroethene	5	U
1,2-Dichloropropane	5	U	1,3-Dichloropropane	5	U
2,2-Dichloropropane	5	U	1,1-Dichloropropene	5	U
Ethylbenzene	5	U	Hexachlorobutadiene	5	U
Isopropylbenzene	5	U	p-Isopropyltoluene	5	U
Methylene chloride	31	V	Naphthalene	5	U
n-Propylbenzene	5	U	Styrene	5	U
1,1,1,2-Tetrachloroethane	5	U	1,1,2,2-Tetrachloroethane	5	U
Tetrachloroethene	5	U	Toluene	5	U
1,2,3-Trichlorobenzene	5	U	1,2,4-Trichlorobenzene	5	U
1,1,1-Trichloroethane	5	U	1,1,2-Trichloroethane	5	U
Trichloroethene	5	U	Trichlorofluoromethane	5	U
1,2,3-Trichloropropane	5	U	1,2,4-Trimethylbenzene	5	U
1,3,5-Trimethylbenzene	5	U	Vinyl chloride	5	U
m&p-Xylenes	5	U	o-Xylene	5	U
MTBE	5	U	(Surr) 1,2-Dichloroethane-d4 (%)	130	
(Surr) Toluene-d8 (%)	124		(Surr) 4-Bromofluorobenzene (%)	125	

# Quality Control Report for LCS Analysis

## Volatile Organics

Matrix: Soil  
Lab Sample ID: LCS  
QC Batch ID: 9901MS2069  
LCS Units: ug/kg

Analysis Date: 01/29/1999  
Preparation Date: 01/29/1999  
Method: EPA 8021  
Analyst: KN

Analyte	LCS Conc	LCS Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Benzene	50	55	110	69	139
Carbon tetrachloride	50	50	100	64	134
Chlorobenzene	50	53	106	77	127
1,4-Dichlorobenzene	50	54	108	80	125
1,1-Dichloroethene	50	52	104	64	137
Ethylbenzene	50	48	96	66	128
Toluene	50	46	92	65	135
Trichloroethene	50	51	102	69	136

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Polynuclear Aromatic Hydrocarb

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS KEY WEST  
PROJECT NUMBER:  
DATE RECEIVED: 01/29/1999  
ANALYTICAL PROTOCOL: EPA 8100

Lab Reference Number : 99010242-1  
Client Sample ID : A902-SD-01  
Date Sampled : 01/28/1999  
Date Extracted : 02/03/1999  
Date Analyzed : 02/03/1999  
Percent Moisture : 85.1  
Sample Matrix (as Received): Sediment  
Analysis Confirmed : No  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
100	Acenaphthene	670 U	ug/kg	VLC
100	Acenaphthylene	670 U	ug/kg	VLC
100	Anthracene	670 U	ug/kg	VLC
100	Benzo(a)anthracene	670 U	ug/kg	VLC
100	Benzo(a)pyrene	670 U	ug/kg	VLC
100	Benzo(b)fluoranthene	670 U	ug/kg	VLC
100	Benzo(ghi)perylene	670 U	ug/kg	VLC
100	Benzo(k)fluoranthene	670 U	ug/kg	VLC
100	Chrysene	670 U	ug/kg	VLC
100	Dibenzo(ah)anthracene	670 U	ug/kg	VLC
100	Fluoranthene	670 U	ug/kg	VLC
100	Fluorene	670 U	ug/kg	VLC
100	Indeno(123-cd)pyrene	670 U	ug/kg	VLC
100	Naphthalene	670 U	ug/kg	VLC
100	1-Methyl naphthalene	670 U	ug/kg	VLC
100	2-Methyl naphthalene	670 U	ug/kg	VLC
100	Phenanthrene	670 U	ug/kg	VLC
100	Pyrene	670 U	ug/kg	VLC
	(Surr) 2-Fluorobiphenyl (%)	72	%	VLC

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Dry Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

# Quality Control Report for Spike Analysis

## Polynuclear Aromatic Hydrocarbons

Matrix: Soil

Lab Sample ID: 9901227-10

QC Batch ID: 9902PAH014

Spike Units: ug/kg

Analysis Date: 02/03/1999

Preparation Date: 02/03/1999

Method: EPA 8100

Analyst: VLC

Analyte	Spike Amount	Sample Result	Spike Result	Percent Recovery	Lower Control Limit	Upper Control Limit
(Surr) 2-Fluorobiphenyl	100	0	82	82	45	120
Acenaphthene	50	0	35	71	46	125
Acenaphthylene	50	0	36	71	42	105
Anthracene	50	0	37	74	53	132
Benzo(a)anthracene	50	0	36	72	41	128
Benzo(a)pyrene	50	0	33	66	45	125
Benzo(b)fluoranthene	50	0	29	58	44	125
Benzo(ghi)perylene	50	0	38	77	37	132
Benzo(k)fluoranthene	50	0	28	56	44	126
Chrysene	50	0	34	67	48	125
Dibenzo(ah)anthracene	50	0	45	89	39	123
Fluoranthene	50	0	36	73	49	118
Fluorene	50	0	37	75	44	112
Indeno(123-cd)pyrene	50	0	42	85	36	124
Naphthalene	50	0	37	73	38	102
Phenanthrene	50	0	38	75	45	118
Pyrene	50	0	37	74	49	120



# Quality Control Report for LCS Analysis

## Polynuclear Aromatic Hydrocarbons

Matrix: Soil

Lab Sample ID: LCS

QC Batch ID: 9902PAH014

LCS Units: ug/kg

Analysis Date: 02/03/1999

Preparation Date: 02/03/1999

Method: EPA 8100

Analyst: VLC

Analyte	LCS Conc	LCS Result	Percent Recovery	Lower Control Limit	Upper Control Limit
(Surr) 2-Fluorobiphenyl	100	78	78	51	100
Acenaphthene	50	36	71	62	125
Acenaphthylene	50	36	71	55	100
Anthracene	50	38	76	64	128
Benzo(a)anthracene	50	34	68	54	110
Benzo(a)pyrene	50	29	59	56	114
Benzo(b)fluoranthene	50	29	58	53	119
Benzo(ghi)perylene	50	32	64	50	112
Benzo(k)fluoranthene	50	29	58	53	119
Chrysene	50	32	63	53	114
Dibenzo(ah)anthracene	50	29	57	51	116
Fluoranthene	50	37	73	58	110
Fluorene	50	37	74	54	107
Indeno(123-cd)pyrene	50	28	56	51	115
Naphthalene	50	36	72	53	94
Phenanthrene	50	38	75	53	112
Pyrene	50	36	73	60	111

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Petroleum Hydrocarbons

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS KEY WEST  
PROJECT NUMBER:  
DATE RECEIVED: 01/29/1999  
ANALYTICAL PROTOCOL: FL-PRO

Lab Reference Number : 99010242-1  
Client Sample ID : A902-SD-01  
Date Sampled : 01/28/1999  
Date Extracted : 02/03/1999  
Date Analyzed : 02/03/1999  
Percent Moisture 85.1  
Sample Matrix (as Received): Sediment  
Analysis Confirmed : No  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
4.0	Total PHS	160	mg/kg	SGA
	(Surr) C-39 (%)	89	%	SGA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Dry Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194

Report of Analysis

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS KEY WEST  
PROJECT NUMBER:  
DATE RECEIVED: 01/29/1999

Lab Reference Number : 99010242-1  
Client Sample ID : A902-SD-01  
Date Sampled : 01/28/1999  
Percent Moisture 85.1  
Sample Matrix (as Received): Sediment

Method	Parameter	Results/Flag	Units	Analyst	Date Prep	Date Anal	MDL
EPA 6010	Lead, Total	625	mg/kg	GG	02/03/1999	02/04/1999	0.3

U = Undetected. The value preceeding the 'U' is the MDL for the analyte. Results reported on a Dry Weight basis (where applicable).

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 8

# Quality Control Report for Spike Analysis

## INORGANICS

Analyte		Spike Amount	Sample Result	Spike Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Method: EPA 6010A Lead, Total	QC Batch: 9902RC032	Sample ID: 9902013-11 10.0 mg/kg	Date Prep: 02/03/1999 2.8	Date Anal: 02/04/1999 12.1	93	Analyst: GG 66	123
Method: FL-PRO SS_C-39	QC Batch: 9902FLRO015	Sample ID: 9901227-10 100.0 mg/kg	Date Prep: 02/03/1999 0.0	Date Anal: 02/03/1999 116.0	116	Analyst: SGA 5	150
Method: FL-PRO Total PHS	QC Batch: 9902FLRO015	Sample ID: 9901227-10 5.0 mg/kg	Date Prep: 02/03/1999 0.0	Date Anal: 02/03/1999 3.8	76	Analyst: SGA 54	111

# Quality Control Report for LCS/LCS Duplicate Analysis

## INORGANICS

Analyte		LCS Conc		LCS Result	Percent Recovery	LCSD Result	Percent Recovery	RPD	
Method: FL-PRO SS_C-39	QC Batch: 9902FLRO015	Sample ID: LCS 100.0 mg/kg	Date Prep: 02/03/1999	Date Anal: 02/03/1999	Analyst: SGA	122.0	122	121.0 121	1
Method: FL-PRO Total PHS	QC Batch: 9902FLRO015	Sample ID: LCS 50.0 mg/kg	Date Prep: 02/03/1999	Date Anal: 02/03/1999	Analyst: SGA	32.2	64	33.5 67	4

### Quality Control Limits

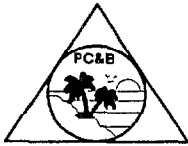
Analyte	Lower Limit	Upper Limit	RPD
SS_C-39	0	145	33
Total PHS	55	110	11

# Quality Control Report for LCS Analysis

## INORGANICS

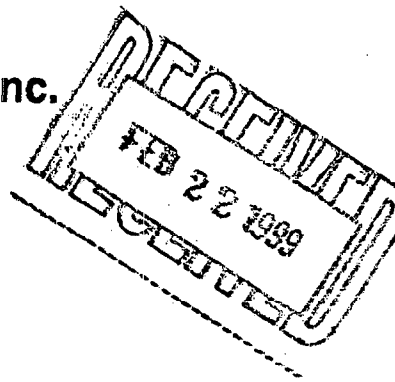
Analyte		LCS Conc		LCS Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Method: EPA 6010A	QC Batch: 9902RC032	Sample ID: LCS	Date Prep: 02/03/1999	Date Anal: 02/04/1999	Analyst: GG		
Lead, Total		10.0 mg/kg	0.0	10.2	102	77	124





## PC&B Environmental Laboratories, Inc.

210 Park Road, Oviedo, Florida 32765  
Phone: 407-359-7194 Fax: 407-359-7197



02-17-1999

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

Dear Paul Calligan:

Enclosed are the results of the analysis of your samples received 02/02/1999.

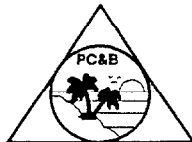
Our laboratory is certified by the Florida DHRS (Lab #E83239) and operates under an FDEP approved Comprehensive Quality Assurance Plan (#900134G). Unless otherwise noted, all results are reported as received. All data were determined in accordance with published procedures (EPA-600/4-79-020), Methods for Chemical Analysis of Water and Wastes, Revised March 1983 and/or Standard Methods for the examination of Water and Wastewater, 18th Edition 1989 and/or Test Methods for Evaluating Solid Waste (EPA-SW-846, Revised January 1995), unless stated otherwise in our CompQapp under method modifications.

If you have any questions, please do not hesitate to give me a call.

Sincerely,

  
Beckie J. Burdick  
Laboratory Manager





## PC&B Environmental Laboratories, Inc.

210 Park Road, Oviedo, Florida 32765  
Phone: 407-359-7194 Fax: 407-359-7197

Client : Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

Contact : Paul Calligan  
Phone : (850) 656-5458

**Laboratory Reference Number : 99020016**

Project Name : NAS Key West

Project Number :

Chain of Custody :

Sample temperature at time of receipt: 4 degrees C

Laboratory ID	Matrix	Client ID	Status	Date/Time Sampled
99020016-1	Water	A902-RB-01	RUN	02/01/1999 11:20

Number	Parameter	Description
1	EPA 504	EDB/DBCP
1	EPA 8310	PAH's by HPLC
1	FL-PRO	Petroleum Hydrocarbons
1	EPA 8021	Volatile Organics
1	EPA 6010	Lead by ICAP

# PC&B Environmental Laboratories, Inc.

210 Park Road  
Oviedo, FL 32765  
407-359-7194 - (FAX) 359-7197

## Case Narrative

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

CASE NARRATIVE for Work Order: 99020016  
Project Number:  
Project Name: NAS Key West

This Case Narrative is a summary of events and/or problems encountered with this Work Order.

For samples requesting EPA 601/602/8010/8020/8021 analysis, the GCMS method EPA 624/8260 was substituted in order to generate the highest quality data possible at no additional cost.

### Definition of Flags

DL	=	No surrogate result due to dilution or matrix interference.
J	=	Estimated Value, value not accurate.
L	=	Off-scale high. Actual value is greater than value given.
Q	=	Sample held beyond the accepted holding time.
T	=	Value reported is less than the laboratory method detection limit.
V	=	Analyte was both detected in the method blank and sample.



## PC&B Environmental Laboratories, Inc.

210 Park Road, Oviedo, Florida 32765  
Phone: 407-359-7194 Fax: 407-359-7197

### QC Batch Summary

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

QC BATCH SUMMARY for Work Order: 99020016  
Project Number:  
Project Name: NAS Key West

Method	SubNum	QC Batch
EPA 504 - EDB/DBCP	-1	9902EDB002
EPA 6010 - Lead by ICAP	-1	9902RC022
EPA 8310 - PAH's by HPLC	-1	9902PAH025
FL-PRO - Petroleum Hydrocarbons	-1	9902FLRO013
EPA 8021 - Volatile Organics	-1	9902MS1005

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER:  
DATE RECEIVED: 02/02/1999  
ANALYTICAL PROTOCOL: EPA 8021

Lab Reference Number : 99020016-1  
Client Sample ID : A902-RB-01  
Date Sampled : 02/01/1999  
Date Extracted : 02/02/1999  
Date Analyzed : 02/02/1999  
Sample Matrix (as Received): Water  
Analysis Confirmed : GCMS  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
1.0	Benzene	1.0 U	ug/l	KN
1.0	Bromobenzene	1.0 U	ug/l	KN
1.0	Bromochloromethane	1.0 U	ug/l	KN
1.0	Bromodichloromethane	1.0 U	ug/l	KN
1.0	Bromoform	1.0 U	ug/l	KN
1.0	Bromomethane	1.0 U	ug/l	KN
1.0	n-Butylbenzene	1.0 U	ug/l	KN
1.0	sec-Butylbenzene	1.0 U	ug/l	KN
1.0	tert-Butylbenzene	1.0 U	ug/l	KN
1.0	Carbon tetrachloride	1.0 U	ug/l	KN
1.0	Chlorobenzene	1.0 U	ug/l	KN
1.0	Chloroethane	1.0 U	ug/l	KN
1.0	Chloroform	1.0 U	ug/l	KN
1.0	Chloromethane	1.0 U	ug/l	KN
1.0	2-Chlorotoluene	1.0 U	ug/l	KN
1.0	4-Chlorotoluene	1.0 U	ug/l	KN
1.0	Dibromochloromethane	1.0 U	ug/l	KN
1.0	1,2-Dibromoethane	1.0 U	ug/l	KN
1.0	Dibromomethane	1.0 U	ug/l	KN
1.0	1,2-Dichlorobenzene	1.0 U	ug/l	KN
1.0	1,3-Dichlorobenzene	1.0 U	ug/l	KN
1.0	1,4-Dichlorobenzene	1.0 U	ug/l	KN
1.0	Dichlorodifluoromethane	1.0 U	ug/l	KN
1.0	1,1-Dichloroethane	1.0 U	ug/l	KN
1.0	1,2-Dichloroethane	1.0 U	ug/l	KN
1.0	1,1-Dichloroethene	1.0 U	ug/l	KN
1.0	cis-1,2-Dichloroethene	1.0 U	ug/l	KN
1.0	trans-1,2-Dichloroethene	1.0 U	ug/l	KN
1.0	1,2-Dichloropropane	1.0 U	ug/l	KN
1.0	1,3-Dichloropropane	1.0 U	ug/l	KN
1.0	2,2-Dichloropropane	1.0 U	ug/l	KN
1.0	1,1-Dichloropropene	1.0 U	ug/l	KN
1.0	1,3-Dichloropropene (cis)	1.0 U	ug/l	KN
1.0	1,3-Dichloropropene (trans)	1.0 U	ug/l	KN
1.0	Ethylbenzene	1.0 U	ug/l	KN
1.0	Hexachlorobutadiene	1.0 U	ug/l	KN
1.0	Isopropylbenzene	1.0 U	ug/l	KN
1.0	p-Isopropyltoluene	1.0 U	ug/l	KN
1.0	Methylene chloride	3.7 V	ug/l	KN
1.0	Naphthalene	1.0 U	ug/l	KN
1.0	n-Propylbenzene	1.0 U	ug/l	KN
1.0	Styrene	1.0 U	ug/l	KN
1.0	1,1,1,2-Tetrachloroethane	1.0 U	ug/l	KN
1.0	1,1,2,2-Tetrachloroethane	1.0 U	ug/l	KN
1.0	Tetrachloroethene	1.0 U	ug/l	KN
1.0	Toluene	1.0 U	ug/l	KN
1.0	1,2,3-Trichlorobenzene	1.0 U	ug/l	KN
1.0	1,2,4-Trichlorobenzene	1.0 U	ug/l	KN
1.0	1,1,1-Trichloroethane	1.0 U	ug/l	KN
1.0	1,1,2-Trichloroethane	1.0 U	ug/l	KN
1.0	Trichloroethene	1.0 U	ug/l	KN
1.0	Trichlorofluoromethane	1.0 U	ug/l	KN
1.0	1,2,3-Trichloropropane	1.0 U	ug/l	KN
1.0	1,2,4-Trimethylbenzene	1.0 U	ug/l	KN

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER:  
DATE RECEIVED: 02/02/1999  
ANALYTICAL PROTOCOL: EPA 8021

Lab Reference Number : 99020016-1  
Client Sample ID : A902-RB-01  
Date Sampled : 02/01/1999  
Date Extracted : 02/02/1999  
Date Analyzed : 02/02/1999  
Sample Matrix (as Received): Water  
Analysis Confirmed : GCMS  
Dilution Factor : 1

	MDL	Analyte		Results/Flag	Units	Analyst
1.0		1,3,5-Trimethylbenzene	1.0 U	ug/l	KN	
1.0		Vinyl chloride	1.0 U	ug/l	KN	
1.0		MTBE	1.0 U	ug/l	KN	
1.0		o-Xylene	1.0 U	ug/l	KN	
1.0		m-Xylene	1.0 U	ug/l	KN	
1.0		p-Xylene	1.0 U	ug/l	KN	
		(Surr) 1,2-Dichloroethane-d4 (%)	99	%	KN	
		(Surr) Toluene-d8 (%)	86	%	KN	
		(Surr) 4-Bromofluorobenzene (%)	122	%	KN	

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

# Quality Control Report for Spike Analysis

## Volatile Organics

Matrix: Water

Lab Sample ID: 99020016-1

QC Batch ID: 9902MS1005

Spike Units: ug/l

Analysis Date: 02/02/1999

Preparation Date: 02/02/1999

Method: EPA 8021

Analyst: KN

Analyte	Spike Amount	Sample Result	Spike Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Benzene	50.0	0.0	54.0	108	67	146
Carbon tetrachloride	50.0	0.0	46.0	92	67	135
Chlorobenzene	50.0	0.0	51.0	102	67	128
1,4-Dichlorobenzene	50.0	0.0	50.0	100	72	134
1,1-Dichloroethene	50.0	0.0	49.0	98	70	125
Ethylbenzene	50.0	0.0	51.0	102	75	127
Toluene	50.0	0.0	49.0	98	64	131
Trichloroethene	50.0	0.0	56.0	112	75	122
m-Xylene	50.0	0.0	46.0	92	68	133

# Quality Control Report for LCS Analysis

## Volatile Organics

Matrix: Water

Lab Sample ID: LCS

QC Batch ID: 9902MS1005

LCS Units: ug/l

Analysis Date: 02/02/1999

Preparation Date: 02/02/1999

Method: EPA 8021

Analyst: KN

Analyte	LCS Conc	LCS Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Benzene	20.0	24.0	120	75	120
Carbon tetrachloride	20.0	22.0	110	75	120
Chlorobenzene	20.0	22.0	110	75	120
1,4-Dichlorobenzene	20.0	19.0	95	75	120
1,1-Dichloroethene	20.0	19.0	95	75	120
Ethylbenzene	20.0	19.0	95	75	120
Toluene	20.0	24.0	120	75	120
Trichloroethene	20.0	21.0	105	75	120
m-Xylene	40.0	48.0	120	75	120

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

PAH's by HPLC

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER:  
DATE RECEIVED: 02/02/1999  
ANALYTICAL PROTOCOL: EPA 8310

Lab Reference Number : 99020016-1  
Client Sample ID : A902-RB-01  
Date Sampled : 02/01/1999  
Date Extracted : 02/05/1999  
Date Analyzed : 02/05/1999  
Sample Matrix (as Received): Water  
Analysis Confirmed : No  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
5	Acenaphthene	5 U	ug/l	ELA
5	Acenaphthylene	5 U	ug/l	ELA
5	Anthracene	5 U	ug/l	ELA
0.2	Benzo(a)anthracene	0.2 U	ug/l	ELA
0.25	Benzo(a)pyrene	0.25 U	ug/l	ELA
0.2	Benzo(b)fluoranthene	0.2 U	ug/l	ELA
0.2	Benzo(ghi)perylene	0.2 U	ug/l	ELA
0.25	Benzo(k)fluoranthene	0.25 U	ug/l	ELA
0.01	Chrysene	0.01 U	ug/l	ELA
0.2	dibenzo(ah)anthracene	0.2 U	ug/l	ELA
0.01	Fluoranthene	0.01 U	ug/l	ELA
0.01	Fluorene	2.04	ug/l	ELA
0.10	Indeno(123cd)pyrene	0.10 U	ug/l	ELA
0.05	Naphthalene	2.73	ug/l	ELA
0.05	1-Methyl naphthalene	2.08	ug/l	ELA
0.05	2-Methyl naphthalene	1.69	ug/l	ELA
0.025	Phenanthrene	0.033	ug/l	ELA
0.025	Pyrene	0.025 U	ug/l	ELA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 



# Quality Control Report for LCS Analysis

## PAH's by HPLC

Matrix: Water  
Lab Sample ID: LCS  
QC Batch ID: 9902PAH025  
LCS Units: ug/l

Analysis Date: 02/05/1999  
Preparation Date: 02/05/1999  
Method: EPA 8310  
Analyst: ELA

Analyte	LCS Conc	LCS Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Acenaphthene	50.0	40.7	81	60	120
Acenaphthylene	25.0	20.2	81	60	120
Anthracene	1.0	0.9	91	60	120
Benzo(a)anthracene	2.5	2.2	87	60	120
Benzo(a)pyrene	2.5	2.2	89	60	120
Benzo(b)fluoranthene	1.0	0.9	87	60	120
Benzo(ghi)perylene	4.0	3.5	87	60	120
Benzo(k)fluoranthene	1.0	0.9	88	60	120
Chrysene	2.5	2.3	90	60	120
dibenzo(ah)anthracene	10.0	8.9	89	60	120
Fluoranthene	2.5	2.1	86	60	120
Fluorene	5.0	4.1	81	60	120
Indeno(123cd)pyrene	2.5	2.4	95	60	120
Naphthalene	25.0	19.4	77	60	120
Phenanthrene	2.0	1.7	85	60	120
Pyrene	5.0	4.2	84	60	120

# Quality Control Report for Spike Analysis

## PAH's by HPLC

Matrix: Water

Lab Sample ID: 991244-1

QC Batch ID: 9902PAH025

Spike Units: ug/l

Analysis Date: 02/05/1999

Preparation Date: 02/05/1999

Method: EPA 8310

Analyst: ELA

Analyte	Spike Amount	Sample Result	Spike Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Acenaphthene	50.0	0.0	38.4	77	45	133
Acenaphthylene	25.0	0.0	19.1	77	45	133
Anthracene	1.0	0.0	0.9	88	45	133
Benzo(a)anthracene	2.5	0.0	2.2	87	45	133
Benzo(a)pyrene	2.5	0.0	2.3	90	45	133
Benzo(b)fluoranthene	1.0	0.0	0.9	88	45	133
Benzo(ghi)perylene	4.0	0.0	3.5	87	45	133
Benzo(k)fluoranthene	1.0	0.0	0.9	88	45	133
Chrysene	2.5	0.0	2.3	90	45	133
dibenzo(ah)anthracene	10.0	0.0	8.9	89	45	160
Fluoranthene	2.5	0.0	2.1	86	45	133
Fluorene	5.0	0.0	3.9	78	45	133
Indeno(123cd)pyrene	2.5	0.0	2.4	94	45	133
Naphthalene	25.0	0.0	18.4	74	45	133
Phenanthrene	2.0	0.0	1.6	82	45	133
Pyrene	5.0	0.0	4.2	83	45	133

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

EDB/DBCP

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER:  
DATE RECEIVED: 02/02/1999  
ANALYTICAL PROTOCOL: EPA 504

Lab Reference Number : 99020016-1  
Client Sample ID : A902-RB-01  
Date Sampled : 02/01/1999  
Date Extracted : 02/12/1999  
Date Analyzed : 02/15/1999  
Sample Matrix (as Received): Water  
Analysis Confirmed : No  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
0.02	Ethylene dibromide (EDB)	0.02 U	ug/l	SGA
0.1	1,2-Dibromo-3-chloropropane	0.1 U	ug/l	SGA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

# Quality Control Report for LCS Analysis

## EDB/DBCP

Matrix: Water

Lab Sample ID: LCS

QC Batch ID: 9902EDB002

LCS Units: ug/l

Analysis Date: 02/15/1999

Preparation Date: 02/12/1999

Method: EPA 504

Analyst: SGA

Analyte	LCS Conc	LCS Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Ethylene dibromide (EDB)	0.10	0.10	101	75	120
1,2-Dibromo-3-chloropropane	0.1	0.1	104	75	120

# Quality Control Report for Spike Analysis

## EDB/DBCP

Matrix: Water

Lab Sample ID: 9902016-1

QC Batch ID: 9902EDB002

Spike Units: ug/l

Analysis Date: 02/15/1999

Preparation Date: 02/12/1999

Method: EPA 504

Analyst: SGA

Analyte	Spike Amount	Sample Result	Spike Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Ethylene dibromide (EDB)	0.10	0.00	0.13	134	48	135
1,2-Dibromo-3-chloropropane	0.1	0.0	0.1	128	43	134

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Petroleum Hydrocarbons

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER:  
DATE RECEIVED: 02/02/1999  
ANALYTICAL PROTOCOL: FL-PRO

Lab Reference Number : 99020016-1  
Client Sample ID : A902-RB-01  
Date Sampled : 02/01/1999  
Date Extracted : 02/03/1999  
Date Analyzed : 02/03/1999  
Sample Matrix (as Received): Water  
Analysis Confirmed : No  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
0.1	Total PHS	0.1 U	mg/l	SGA
	(Surr) C-39 (%)	58	%	SGA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

# Quality Control Report for Spike Analysis

## Petroleum Hydrocarbons

Matrix: Water

Lab Sample ID: 9901097-1

QC Batch ID: 9902FLRO013

Spike Units: mg/l

Analysis Date: 02/03/1999

Preparation Date: 02/03/1999

Method: FL-PRO

Analyst: SGA

Analyte	Spike Amount	Sample Result	Spike Result	Percent Recovery	Lower Control Limit	Upper Control Limit
(Surr) C-39	100.0	0.0	126.0	126	7	139
Total PHS	50.0	0.0	33.0	66	57	110

# Quality Control Report for LCS/LCS Duplicate Analysis

## Petroleum Hydrocarbons

Matrix: Water  
Lab Sample ID: LCS  
QC Batch ID: 9902FLRO013  
LCS Units: mg/l

Analysis Date: 02/03/1999  
Preparation Date: 02/03/1999  
Method: FL-PRO  
Analyst: SGA

Analyte	LCS Conc		LCS Result	LCS Percent Recovery	LCSD Result	LCSD Percent Recovery	RPD
(Surr) C-39	100.0	0.0	122.0	122	121.0	121	1
Total PHS	50.0	0.0	32.2	64	33.5	67	4

Quality Control Limits			
Analyte	Lower Limit	Upper Limit	RPD
SS_C-39	4	140	31
Total PHS	57	110	11



PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194

Report of Analysis

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER:  
DATE RECEIVED: 02/02/1999

Lab Reference Number : 99020016-1  
Client Sample ID : A902-RB-01  
Date Sampled : 02/01/1999  
Sample Matrix (as Received): Water

Method	Parameter	Results/Flag	Units	Analyst	Date Prep	Date Anal	MDL
EPA 6010	Lead, Total	3 U	ug/l	GG	02/03/1999	02/03/1999	3

U = Undetected. The value preceeding the 'U' is the MDL for the analyte. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by :



# Quality Control Report for LCS Analysis

## INORGANICS

Analyte		LCS Conc		LCS Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Method: EPA 6010	QC Batch: 9902RC022	Sample ID: LCS	Date Prep: 02/03/1999	Date Anal: 02/03/1999	Analyst: GG		
Lead, Total		100 ug/l	0	105	105	85	117

# Quality Control Report for Spike Analysis

## INORGANICS

Analyte		Spike Amount	Sample Result	Spike Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Method: EPA 6010	QC Batch: 9902RC022	Sample ID: 9902003-2	Date Prep: 02/03/1999	Date Anal: 02/03/1999	Analyst: GG		
Lead, Total		100 ug/l	0	97	97	78	120

210 Park Road, Oviedo, FL 32765  
407-359-7194 (fax) 407-359-7197

# CHAIN OF CUSTODY

4405 VINELAND ROAD • SUITE C-15

ORLANDO, FL 32811

TEL: 407-425-6700 • FAX: 407-425-0707

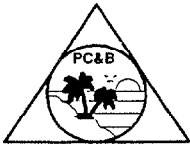
~~ACCTEST JOB #:~~

990200

**ACCUTEST QUOTE #:**[illegible]

## **APPENDIX H**

### **LABORATORY ANALYTICAL REPORTS FOR GROUNDWATER**



## PC&B Environmental Laboratories, Inc.

210 Park Road, Oviedo, Florida 32765  
Phone: 407-359-7194 Fax: 407-359-7197

12-14-1998

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

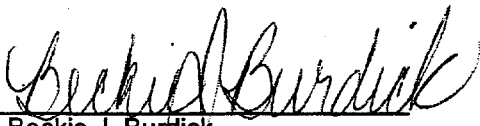
Dear Paul Calligan:

Enclosed are the results of the analysis of your samples received 12/03/1998.

Our laboratory is certified by the Florida DHRS (Lab #E83239) and operates under an FDEP approved Comprehensive Quality Assurance Plan (#900134G). Unless otherwise noted, all results are reported as received. All data were determined in accordance with published procedures (EPA-600/4-79-020), Methods for Chemical Analysis of Water and Wastes, Revised March 1983 and/or Standard Methods for the examination of Water and Wastewater, 18th Edition 1989 and/or Test Methods for Evaluating Solid Waste (EPA-SW-846, Revised January 1995), unless stated otherwise in our CompQapp under method modifications.

If you have any questions, please do not hesitate to give me a call.

Sincerely,

  
Beckie J. Burdick  
Laboratory Manager



## PC&B Environmental Laboratories, Inc.

210 Park Road, Oviedo, Florida 32765  
Phone: 407-359-7194 Fax: 407-359-7197

Client : Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

Contact : Paul Calligan  
Phone : (850) 656-5458

**Laboratory Reference Number : 98120026**

Project Name : Truck Fill Stand

Project Number : 7586

Chain of Custody : 13030

Sample temperature at time of receipt: 4 degrees C

Laboratory ID	Matrix	Client ID	Status	Date/Time Sampled
98120026-1	Water	A902-GW-MW1-001	RUN	12/02/1998 15:50
98120026-2	Water	A902-GW-MW2-001	RUN	12/02/1998 16:31
98120026-3	Water	A902-GW-MW7-001	RUN	12/02/1998 17:16

Number	Parameter	Description
3	EPA 504	EDB/DBCP
3	EPA 8310	PAH's by HPLC
3	FL-PRO	Petroleum Hydrocarbons
3	EPA 8021	Volatile Organics
3	EPA 6010	Lead by ICAP

# PC&B Environmental Laboratories, Inc.

210 Park Road  
Oviedo, FL 32765  
407-359-7194 - (FAX) 359-7197

## Case Narrative

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

CASE NARRATIVE for Work Order: 98120026  
Project Number: 7586  
Project Name: Truck Fill Stand

This Case Narrative is a summary of events and/or problems encountered with this Work Order.

EPA 8310 results were reported by EPA 610 GC analysis due to high organic matrix interference.

For samples requesting EPA 601/602/8010/8020/8021 analysis, the GCMS method EPA 624/8260 was substituted in order to generate the highest quality data possible at no additional cost.

### Definition of Flags

DL	=	No surrogate result due to dilution or matrix interference.
J	=	Estimated Value, value not accurate.
L	=	Off-scale high. Actual value is greater than value given.
Q	=	Sample held beyond the accepted holding time.
T	=	Value reported is less than the laboratory method detection limit.
V	=	Analyte was both detected in the method blank and sample.



## QC Batch Summary

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

QC BATCH SUMMARY for Work Order: 98120026  
Project Number: 7586  
Project Name: Truck Fill Stand

Method	SubNum	QC Batch
<b>EPA 504 - EDB/DBCP</b>		
	-1	9812EDB002
	-2	9812EDB002
	-3	9812EDB002
<b>EPA 6010 - Lead by ICAP</b>		
	-1	9812RC031
	-2	9812RC031
	-3	9812RC031
<b>EPA 8310 - PAH's by HPLC</b>		
	-1	9812PAH037
	-2	9812PAH037
	-3	9812PAH037
<b>FL-PRO - Petroleum Hydrocarbons</b>		
	-1	9812FLRO011
	-2	9812FLRO011
	-3	9812FLRO011
<b>EPA 8021 - Volatile Organics</b>		
	-1	9812MS3012
	-2	9812MS3012
	-3	9812MS3012

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 12/03/1998  
ANALYTICAL PROTOCOL: EPA 8021

Lab Reference Number : 98120026-1  
Client Sample ID : A902-GW-MW1-001  
Date Sampled : 12/02/1998  
Date Extracted : 12/04/1998  
Date Analyzed : 12/04/1998  
Sample Matrix (as Received): Water  
Analysis Confirmed : GCMS  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
1.0	Benzene	4.3	ug/l	KN
1.0	Bromobenzene	1.0 U	ug/l	KN
1.0	Bromochloromethane	1.0 U	ug/l	KN
1.0	Bromodichloromethane	1.0 U	ug/l	KN
1.0	Bromoform	1.0 U	ug/l	KN
1.0	Bromomethane	1.0 U	ug/l	KN
1.0	n-Butylbenzene	1.0 U	ug/l	KN
1.0	sec-Butylbenzene	12.1	ug/l	KN
1.0	tert-Butylbenzene	1.0 U	ug/l	KN
1.0	Carbon tetrachloride	1.0 U	ug/l	KN
1.0	Chlorobenzene	1.0 U	ug/l	KN
1.0	Chloroethane	1.0 U	ug/l	KN
1.0	Chloroform	1.0 U	ug/l	KN
1.0	Chloromethane	1.0 U	ug/l	KN
1.0	2-Chlorotoluene	1.0 U	ug/l	KN
1.0	4-Chlorotoluene	1.0 U	ug/l	KN
1.0	Dibromochloromethane	1.0 U	ug/l	KN
1.0	1,2-Dibromoethane	1.0 U	ug/l	KN
1.0	Dibromomethane	1.0 U	ug/l	KN
1.0	1,2-Dichlorobenzene	1.0 U	ug/l	KN
1.0	1,3-Dichlorobenzene	1.0 U	ug/l	KN
1.0	1,4-Dichlorobenzene	1.0 U	ug/l	KN
1.0	Dichlorodifluoromethane	1.0 U	ug/l	KN
1.0	1,1-Dichloroethane	1.0 U	ug/l	KN
1.0	1,2-Dichloroethane	1.0 U	ug/l	KN
1.0	1,1-Dichloroethene	1.0 U	ug/l	KN
1.0	cis-1,2-Dichloroethene	1.0 U	ug/l	KN
1.0	trans-1,2-Dichloroethene	1.0 U	ug/l	KN
1.0	1,2-Dichloropropane	1.0 U	ug/l	KN
1.0	1,3-Dichloropropane	1.0 U	ug/l	KN
1.0	2,2-Dichloropropane	1.0 U	ug/l	KN
1.0	1,1-Dichloropropene	1.0 U	ug/l	KN
1.0	1,3-Dichloropropene (cis)	1.0 U	ug/l	KN
1.0	1,3-Dichloropropene (trans)	1.0 U	ug/l	KN
1.0	Ethylbenzene	1.0 U	ug/l	KN
1.0	Hexachlorobutadiene	1.0 U	ug/l	KN
1.0	Isopropylbenzene	17.5	ug/l	KN
1.0	p-Isopropyltoluene	1.0 U	ug/l	KN
1.0	Methylene chloride	1.0 U	ug/l	KN
1.0	Naphthalene	1.0 U	ug/l	KN
1.0	n-Propylbenzene	38.4	ug/l	KN
1.0	Styrene	1.0 U	ug/l	KN
1.0	1,1,1,2-Tetrachloroethane	1.0 U	ug/l	KN
1.0	1,1,2,2-Tetrachloroethane	1.0 U	ug/l	KN
1.0	Tetrachloroethene	1.0 U	ug/l	KN
1.0	Toluene	1.0 U	ug/l	KN
1.0	1,2,3-Trichlorobenzene	1.0 U	ug/l	KN
1.0	1,2,4-Trichlorobenzene	1.0 U	ug/l	KN
1.0	1,1,1-Trichloroethane	1.0 U	ug/l	KN
1.0	1,1,2-Trichloroethane	1.0 U	ug/l	KN
1.0	Trichloroethene	1.0 U	ug/l	KN
1.0	Trichlorofluoromethane	1.0 U	ug/l	KN
1.0	1,2,3-Trichloropropane	1.0 U	ug/l	KN
1.0	1,2,4-Trimethylbenzene	1.0 U	ug/l	KN

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 12/03/1998  
ANALYTICAL PROTOCOL: EPA 8021

Lab Reference Number : 98120026-1  
Client Sample ID : A902-GW-MW1-001  
Date Sampled : 12/02/1998  
Date Extracted : 12/04/1998  
Date Analyzed : 12/04/1998  
Sample Matrix (as Received): Water  
Analysis Confirmed : GCMS  
Dilution Factor : 1

	MDL	Analyte		Results/Flag	Units	Analyst
1.0		1,3,5-Trimethylbenzene	1.0 U	ug/l	KN	
1.0		Vinyl chloride	1.0 U	ug/l	KN	
1.0		MTBE	1.0 U	ug/l	KN	
1.0		o-Xylene	1.0 U	ug/l	KN	
1.0		m-Xylene	1.0 U	ug/l	KN	
1.0		p-Xylene	1.0 U	ug/l	KN	
		(Surr) 1,2-Dichloroethane-d4 (%)	72	%	KN	
		(Surr) Toluene-d8 (%)	146	%	KN	
		(Surr) 4-Bromofluorobenzene (%)	128	%	KN	

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 12/03/1998  
ANALYTICAL PROTOCOL: EPA 8021

Lab Reference Number : 98120026-2  
Client Sample ID : A902-GW-MW2-001  
Date Sampled : 12/02/1998  
Date Extracted : 12/04/1998  
Date Analyzed : 12/04/1998  
Sample Matrix (as Received): Water  
Analysis Confirmed : GCMS  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
1.0	Benzene	2.7	ug/l	KN
1.0	Bromobenzene	1.0 U	ug/l	KN
1.0	Bromochloromethane	1.0 U	ug/l	KN
1.0	Bromodichloromethane	1.0 U	ug/l	KN
1.0	Bromoform	1.0 U	ug/l	KN
1.0	Bromomethane	1.0 U	ug/l	KN
1.0	n-Butylbenzene	1.0 U	ug/l	KN
1.0	sec-Butylbenzene	5.6	ug/l	KN
1.0	tert-Butylbenzene	1.0 U	ug/l	KN
1.0	Carbon tetrachloride	1.0 U	ug/l	KN
1.0	Chlorobenzene	1.0 U	ug/l	KN
1.0	Chloroethane	1.0 U	ug/l	KN
1.0	Chloroform	1.0 U	ug/l	KN
1.0	Chloromethane	1.0 U	ug/l	KN
1.0	2-Chlorotoluene	1.0 U	ug/l	KN
1.0	4-Chlorotoluene	1.0 U	ug/l	KN
1.0	Dibromochloromethane	1.0 U	ug/l	KN
1.0	1,2-Dibromoethane	1.0 U	ug/l	KN
1.0	Dibromomethane	1.0 U	ug/l	KN
1.0	1,2-Dichlorobenzene	1.0 U	ug/l	KN
1.0	1,3-Dichlorobenzene	1.0 U	ug/l	KN
1.0	1,4-Dichlorobenzene	1.0 U	ug/l	KN
1.0	Dichlorodifluoromethane	1.0 U	ug/l	KN
1.0	1,1-Dichloroethane	1.0 U	ug/l	KN
1.0	1,2-Dichloroethane	1.0 U	ug/l	KN
1.0	1,1-Dichloroethene	1.0 U	ug/l	KN
1.0	cis-1,2-Dichloroethene	1.0 U	ug/l	KN
1.0	trans-1,2-Dichloroethene	1.0 U	ug/l	KN
1.0	1,2-Dichloropropane	1.0 U	ug/l	KN
1.0	1,3-Dichloropropane	1.0 U	ug/l	KN
1.0	2,2-Dichloropropane	1.0 U	ug/l	KN
1.0	1,1-Dichloropropene	1.0 U	ug/l	KN
1.0	1,3-Dichloropropene (cis)	1.0 U	ug/l	KN
1.0	1,3-Dichloropropene (trans)	1.0 U	ug/l	KN
1.0	Ethylbenzene	1.0 U	ug/l	KN
1.0	Hexachlorobutadiene	1.0 U	ug/l	KN
1.0	Isopropylbenzene	10.0	ug/l	KN
1.0	p-Isopropyltoluene	1.0 U	ug/l	KN
1.0	Methylene chloride	3.1 V	ug/l	KN
1.0	Naphthalene	1.0 U	ug/l	KN
1.0	n-Propylbenzene	18.4	ug/l	KN
1.0	Styrene	1.0 U	ug/l	KN
1.0	1,1,1,2-Tetrachloroethane	1.0 U	ug/l	KN
1.0	1,1,2,2-Tetrachloroethane	1.0 U	ug/l	KN
1.0	Tetrachloroethene	1.0 U	ug/l	KN
1.0	Toluene	1.0 U	ug/l	KN
1.0	1,2,3-Trichlorobenzene	1.0 U	ug/l	KN
1.0	1,2,4-Trichlorobenzene	1.0 U	ug/l	KN
1.0	1,1,1-Trichloroethane	1.0 U	ug/l	KN
1.0	1,1,2-Trichloroethane	1.0 U	ug/l	KN
1.0	Trichloroethene	1.0 U	ug/l	KN
1.0	Trichlorofluoromethane	1.0 U	ug/l	KN
1.0	1,2,3-Trichloropropane	1.0 U	ug/l	KN
1.0	1,2,4-Trimethylbenzene	1.0 U	ug/l	KN

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 12/03/1998  
ANALYTICAL PROTOCOL: EPA 8021

Lab Reference Number : 98120026-2  
Client Sample ID : A902-GW-MW2-001  
Date Sampled : 12/02/1998  
Date Extracted : 12/04/1998  
Date Analyzed : 12/04/1998  
Sample Matrix (as Received): Water  
Analysis Confirmed : GCMS  
Dilution Factor : 1

	MDL	Analyte		Results/Flag	Units	Analyst
1.0		1,3,5-Trimethylbenzene	1.0 U	ug/l	KN	
1.0		Vinyl chloride	1.0 U	ug/l	KN	
1.0		MTBE	1.0 U	ug/l	KN	
1.0		o-Xylene	1.0 U	ug/l	KN	
1.0		m-Xylene	1.0 U	ug/l	KN	
1.0		p-Xylene	1.0 U	ug/l	KN	
		(Surr) 1,2-Dichloroethane-d4 (%)	80	%	KN	
		(Surr) Toluene-d8 (%)	107	%	KN	
		(Surr) 4-Bromofluorobenzene (%)	146	%	KN	

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 12/03/1998  
ANALYTICAL PROTOCOL: EPA 8021

Lab Reference Number : 98120026-3  
Client Sample ID : A902-GW-MW7-001  
Date Sampled : 12/02/1998  
Date Extracted : 12/04/1998  
Date Analyzed : 12/04/1998  
Sample Matrix (as Received): Water  
Analysis Confirmed : GCMS  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
1.0	Benzene	1.0 U	ug/l	KN
1.0	Bromobenzene	1.0 U	ug/l	KN
1.0	Bromochloromethane	1.0 U	ug/l	KN
1.0	Bromodichloromethane	1.0 U	ug/l	KN
1.0	Bromoform	1.0 U	ug/l	KN
1.0	Bromomethane	1.0 U	ug/l	KN
1.0	n-Butylbenzene	1.0 U	ug/l	KN
1.0	sec-Butylbenzene	1.0 U	ug/l	KN
1.0	tert-Butylbenzene	1.0 U	ug/l	KN
1.0	Carbon tetrachloride	1.0 U	ug/l	KN
1.0	Chlorobenzene	1.0 U	ug/l	KN
1.0	Chloroethane	1.0 U	ug/l	KN
1.0	Chloroform	1.0 U	ug/l	KN
1.0	Chloromethane	1.0 U	ug/l	KN
1.0	2-Chlorotoluene	1.0 U	ug/l	KN
1.0	4-Chlorotoluene	1.0 U	ug/l	KN
1.0	Dibromochloromethane	1.0 U	ug/l	KN
1.0	1,2-Dibromoethane	1.0 U	ug/l	KN
1.0	Dibromomethane	1.0 U	ug/l	KN
1.0	1,2-Dichlorobenzene	1.0 U	ug/l	KN
1.0	1,3-Dichlorobenzene	1.0 U	ug/l	KN
1.0	1,4-Dichlorobenzene	1.0 U	ug/l	KN
1.0	Dichlorodifluoromethane	1.0 U	ug/l	KN
1.0	1,1-Dichloroethane	1.0 U	ug/l	KN
1.0	1,2-Dichloroethane	1.0 U	ug/l	KN
1.0	1,1-Dichloroethene	1.0 U	ug/l	KN
1.0	cis-1,2-Dichloroethene	1.0 U	ug/l	KN
1.0	trans-1,2-Dichloroethene	1.0 U	ug/l	KN
1.0	1,2-Dichloropropane	1.0 U	ug/l	KN
1.0	1,3-Dichloropropane	1.0 U	ug/l	KN
1.0	2,2-Dichloropropane	1.0 U	ug/l	KN
1.0	1,1-Dichloropropene	1.0 U	ug/l	KN
1.0	1,3-Dichloropropene (cis)	1.0 U	ug/l	KN
1.0	1,3-Dichloropropene (trans)	1.0 U	ug/l	KN
1.0	Ethylbenzene	26.3	ug/l	KN
1.0	Hexachlorobutadiene	1.0 U	ug/l	KN
1.0	Isopropylbenzene	1.0 U	ug/l	KN
1.0	p-Isopropyltoluene	1.0 U	ug/l	KN
1.0	Methylene chloride	6.4 V	ug/l	KN
1.0	Naphthalene	1.0 U	ug/l	KN
1.0	n-Propylbenzene	1.0 U	ug/l	KN
1.0	Styrene	1.0 U	ug/l	KN
1.0	1,1,1,2-Tetrachloroethane	1.0 U	ug/l	KN
1.0	1,1,2,2-Tetrachloroethane	1.0 U	ug/l	KN
1.0	Tetrachloroethene	1.0 U	ug/l	KN
1.0	Toluene	1.0 U	ug/l	KN
1.0	1,2,3-Trichlorobenzene	1.0 U	ug/l	KN
1.0	1,2,4-Trichlorobenzene	1.0 U	ug/l	KN
1.0	1,1,1-Trichloroethane	1.0 U	ug/l	KN
1.0	1,1,2-Trichloroethane	1.0 U	ug/l	KN
1.0	Trichloroethene	1.0 U	ug/l	KN
1.0	Trichlorofluoromethane	1.0 U	ug/l	KN
1.0	1,2,3-Trichloropropane	1.0 U	ug/l	KN
1.0	1,2,4-Trimethylbenzene	1.0 U	ug/l	KN

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 12/03/1998  
ANALYTICAL PROTOCOL: EPA 8021

Lab Reference Number : 98120026-3  
Client Sample ID : A902-GW-MW7-001  
Date Sampled : 12/02/1998  
Date Extracted : 12/04/1998  
Date Analyzed : 12/04/1998  
Sample Matrix (as Received): Water  
Analysis Confirmed : GCMS  
Dilution Factor : 1

	MDL	Analyte		Results/Flag	Units	Analyst
1.0		1,3,5-Trimethylbenzene	1.0 U	ug/l	KN	
1.0		Vinyl chloride	1.0 U	ug/l	KN	
1.0		MTBE	1.0 U	ug/l	KN	
1.0		o-Xylene	1.0 U	ug/l	KN	
1.0		m-Xylene	1.0 U	ug/l	KN	
1.0		p-Xylene	1.0 U	ug/l	KN	
		(Surr) 1,2-Dichloroethane-d4 (%)	84	%	KN	
		(Surr) Toluene-d8 (%)	130	%	KN	
		(Surr) 4-Bromofluorobenzene (%)	145	%	KN	

U = Undetected. The value preceeding the "U" is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRs Certification # E83239/83353

Reviewed by : 

# Quality Control Report for Method Blank

## Volatile Organics

Matrix: Water

Analysis Date: 12/04/1998

Lab Sample ID: RB-12-04

Preparation Date: 12/04/1998

QC Batch ID: 9812MS3012

Method: EPA 8021

Result Units: ug/l

Analyst: KN

Analyte	Result	Flag	Analyte	Result	Flag
Benzene	1.0	U	Bromobenzene	1.0	U
Bromochloromethane	1.0	U	Bromodichloromethane	1.0	U
Bromoform	1.0	U	Bromomethane	1.0	U
n-Butylbenzene	1.0	U	sec-Butylbenzene	1.0	U
tert-Butylbenzene	1.0	U	Carbon tetrachloride	1.0	U
Chlorobenzene	1.0	U	Chloroethane	1.0	U
Chloroform	1.0	U	Chloromethane	1.0	U
2-Chlorotoluene	1.0	U	4-Chlorotoluene	1.0	U
Dibromochloromethane	1.0	U	1,2-Dibromoethane	1.0	U
Dibromomethane	1.0	U	1,2-Dichlorobenzene	1.0	U
1,3-Dichlorobenzene	1.0	U	1,4-Dichlorobenzene	1.0	U
Dichlorodifluoromethane	1.0	U	1,1-Dichloroethane	1.0	U
1,2-Dichloroethane	1.0	U	1,1-Dichloroethene	1.0	U
cis-1,2-Dichloroethene	1.0	U	trans-1,2-Dichloroethene	1.0	U
1,2-Dichloropropane	1.0	U	1,3-Dichloropropane	1.0	U
2,2-Dichloropropane	1.0	U	1,1-Dichloropropene	1.0	U
1,3-Dichloropropene (cis)	1.0	U	1,3-Dichloropropene (trans)	1.0	U
Ethylbenzene	1.0	U	Hexachlorobutadiene	1.0	U
Isopropylbenzene	1.0	U	p-Isopropyltoluene	1.0	U
Methylene chloride	15.0	V	Naphthalene	1.0	U
n-Propylbenzene	1.0	U	Styrene	1.0	U
1,1,1,2-Tetrachloroethane	1.0	U	1,1,2,2-Tetrachloroethane	1.0	U
Tetrachloroethene	1.0	U	Toluene	1.0	U
1,2,3-Trichlorobenzene	1.0	U	1,2,4-Trichlorobenzene	1.0	U
1,1,1-Trichloroethane	1.0	U	1,1,2-Trichloroethane	1.0	U
Trichloroethene	1.0	U	Trichlorofluoromethane	1.0	U
1,2,3-Trichloropropane	1.0	U	1,2,4-Trimethylbenzene	1.0	U
1,3,5-Trimethylbenzene	1.0	U	Vinyl chloride	1.0	U
MTBE	1.0	U	o-Xylene	1.0	U
m-Xylene	1.0	U	p-Xylene	1.0	U
(Surr) 1,2-Dichloroethane-d4 (%)	95.0		(Surr) Toluene-d8 (%)	135.0	
(Surr) 4-Bromofluorobenzene (%)	118.0				



# Quality Control Report for LCS Analysis

## Volatile Organics

Matrix: Water

Analysis Date: 12/04/1998

Lab Sample ID: LCS

Preparation Date: 12/04/1998

QC Batch ID: 9812MS3012

Method: EPA 8021

LCS Units: ug/l

Analyst: KN

Analyte	LCS Conc	LCS Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Benzene	20.0	19.0	95	75	120
Chlorobenzene	20.0	23.0	115	75	120
1,4-Dichlorobenzene	20.0	22.0	110	75	120
1,1-Dichloroethene	20.0	17.0	85	75	120
Ethylbenzene	20.0	19.0	95	75	120
Toluene	20.0	18.0	90	75	120
Trichloroethene	20.0	24.0	120	75	120
o-Xylene	20.0	21.0	105	75	120
m-Xylene	20.0	21.0	105	75	120
p-Xylene	20.0	23.0	115	75	120

# Quality Control Report for Spike/Spike Duplicate Analysis

## Volatile Organics

Matrix: Water

Analysis Date: 12/04/1998

Lab Sample ID: 9812025-5

Preparation Date: 12/04/1998

QC Batch ID: 9812MS3012

Method: EPA 8021

Spike Units: ug/l

Analyst: KN

Analyte	Spike Amount	Sample Result	Spike Result	Spike Percent Recovery	MSD Result	MSD Percent Recovery	RPD
Benzene	50.0	0.0	48.0	96	52.0	104	8
Chlorobenzene	50.0	0.0	54.0	108	54.0	108	0
1,4-Dichlorobenzene	50.0	0.0	47.0	94	49.0	98	4
1,1-Dichloroethene	50.0	0.0	56.0	112	55.0	110	2
Ethylbenzene	50.0	0.0	57.0	114	53.0	106	7
Toluene	50.0	0.0	42.0	84	47.0	94	11
Trichloroethene	50.0	0.0	57.0	114	57.0	114	0
o-Xylene	50.0	0.0	44.0	88	46.0	92	4
m-Xylene	50.0	0.0	44.0	88	46.0	92	4
p-Xylene	50.0	0.0	47.0	94	48.0	96	2

### Quality Control Limits

Analyte	Lower Limit	Upper Limit	RPD
Benzene	57	146	15
Chlorobenzene	67	128	10
1,4-Dichlorobenzene	72	134	10
1,1-Dichloroethene	70	125	15
Ethylbenzene	75	127	18
Toluene	64	131	11
Trichloroethene	75	122	15
o-Xylene	70	125	20
m-Xylene	68	133	11
p-Xylene	70	125	20

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

PAH's by HPLC

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 12/03/1998  
ANALYTICAL PROTOCOL: EPA 8310

Lab Reference Number : 98120026-1  
Client Sample ID : A902-GW-MW1-001  
Date Sampled : 12/02/1998  
Date Extracted : 12/09/1998  
Date Analyzed : 12/10/1998  
Sample Matrix (as Received): Water  
Analysis Confirmed : No  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
5	Acenaphthene	21	ug/l	EA
5	Acenaphthylene	5 U	ug/l	EA
5	Anthracene	5 U	ug/l	EA
0.2	Benzo(a)anthracene	5.0 U	ug/l	EA
0.25	Benzo(a)pyrene	5.00 U	ug/l	EA
0.2	Benzo(b)fluoranthene	5.0 U	ug/l	EA
0.2	Benzo(ghi)perylene	5.0 U	ug/l	EA
0.25	Benzo(k)fluoranthene	5.00 U	ug/l	EA
0.01	Chrysene	5.00 U	ug/l	EA
0.2	dibenzo(ah)anthracene	5.0 U	ug/l	EA
0.01	Fluoranthene	5.00 U	ug/l	EA
0.01	Fluorene	5.00	ug/l	EA
0.10	Indeno(123cd)pyrene	5.00 U	ug/l	EA
0.05	Naphthalene	52.0	ug/l	EA
0.05	1-Methyl naphthalene	105	ug/l	EA
0.05	2-Methyl naphthalene	59.0	ug/l	EA
0.025	Phenanthrene	8.000	ug/l	EA
0.025	Pyrene	5.000 U	ug/l	EA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

PAH's by HPLC

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 12/03/1998  
ANALYTICAL PROTOCOL: EPA 8310

Lab Reference Number : 98120026-2  
Client Sample ID : A902-GW-MW2-001  
Date Sampled : 12/02/1998  
Date Extracted : 12/09/1998  
Date Analyzed : 12/10/1998  
Sample Matrix (as Received): Water  
Analysis Confirmed : No  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
5	Acenaphthene	7	ug/l	EA
5	Acenaphthylene	5 U	ug/l	EA
5	Anthracene	5 U	ug/l	EA
0.2	Benzo(a)anthracene	5.0 U	ug/l	EA
0.25	Benzo(a)pyrene	5.00 U	ug/l	EA
0.2	Benzo(b)fluoranthene	5.0 U	ug/l	EA
0.2	Benzo(ghi)perylene	5.0 U	ug/l	EA
0.25	Benzo(k)fluoranthene	5.00 U	ug/l	EA
0.01	Chrysene	5.00 U	ug/l	EA
0.2	dibenzo(ah)anthracene	5.0 U	ug/l	EA
0.01	Fluoranthene	5.00 U	ug/l	EA
0.01	Fluorene	5.00 U	ug/l	EA
0.10	Indeno(123cd)pyrene	5.00 U	ug/l	EA
0.05	Naphthalene	81.0	ug/l	EA
0.05	1-Methyl naphthalene	100	ug/l	EA
0.05	2-Methyl naphthalene	92.0	ug/l	EA
0.025	Phenanthrene	11.000	ug/l	EA
0.025	Pyrene	5.000 U	ug/l	EA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FBEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

PAH's by HPLC

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 12/03/1998  
ANALYTICAL PROTOCOL: EPA 8310

Lab Reference Number : 98120026-3  
Client Sample ID : A902-GW-MW7-001  
Date Sampled : 12/02/1998  
Date Extracted : 12/09/1998  
Date Analyzed : 12/10/1998  
Sample Matrix (as Received): Water  
Analysis Confirmed : No  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
5	Acenaphthene	5 U	ug/l	EA
5	Acenaphthylene	5 U	ug/l	EA
5	Anthracene	5 U	ug/l	EA
0.2	Benzo(a)anthracene	5.0 U	ug/l	EA
0.25	Benzo(a)pyrene	5.00 U	ug/l	EA
0.2	Benzo(b)fluoranthene	5.0 U	ug/l	EA
0.2	Benzo(ghi)perylene	5.0 U	ug/l	EA
0.25	Benzo(k)fluoranthene	5.00 U	ug/l	EA
0.01	Chrysene	5.00 U	ug/l	EA
0.2	dibenzo(ah)anthracene	5.0 U	ug/l	EA
0.01	Fluoranthene	5.00 U	ug/l	EA
0.01	Fluorene	2.20 J	ug/l	EA
0.10	Indeno(123cd)pyrene	5.00 U	ug/l	EA
0.05	Naphthalene	6.00	ug/l	EA
0.05	1-Methyl naphthalene	1.30 J	ug/l	EA
0.05	2-Methyl naphthalene	5.00 U	ug/l	EA
0.025	Phenanthrene	2.800 J	ug/l	EA
0.025	Pyrene	5.000 U	ug/l	EA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

# Quality Control Report for Method Blank

## PAH's by HPLC

Matrix: Water

Lab Sample ID: RB-12-9

QC Batch ID: 9812PAH037

Result Units: ug/l

Analysis Date: 12/10/1998

Preparation Date: 12/09/1998

Method: EPA 8310

Analyst: DC

Analyte	Result	Flag	Analyte	Result	Flag
Acenaphthene	5	U	Acenaphthylene	5	U
Anthracene	5	U	Benzo(a)anthracene	0.2	U
Benzo(a)pyrene	0.25	U	Benzo(b)fluoranthene	0.2	U
Benzo(ghi)perylene	0.2	U	Benzo(k)fluoranthene	0.25	U
Chrysene	0.01	U	dibenzo(ah)anthracene	0.2	U
Fluoranthene	0.01	U	Fluorene	0.01	U
Indeno(123cd)pyrene	0.10	U	Naphthalene	0.05	U
1-Methyl naphthalene	0.05	U	2-Methyl naphthalene	0.05	U
Phenanthrene	0.025	U	Pyrene	0.025	U

# Quality Control Report for LCS Analysis

## PAH's by HPLC

Matrix: Water

Lab Sample ID: LCS

QC Batch ID: 9812PAH037

LCS Units: ug/l

Analysis Date: 12/10/1998

Preparation Date: 12/09/1998

Method: EPA 8310

Analyst: DC

Analyte	LCS Conc	LCS Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Acenaphthene	50.0	30.7	61	60	120
Acenaphthylene	25.0	16.6	66	60	120
Anthracene	1.0	0.9	93	60	120
Benzo(a)anthracene	2.5	2.0	79	60	120
Benzo(a)pyrene	2.5	2.0	79	60	120
Benzo(b)fluoranthene	1.0	0.8	81	60	120
Benzo(ghi)perylene	4.0	3.1	78	60	120
Benzo(k)fluoranthene	1.0	0.8	83	60	120
Chrysene	2.5	1.9	77	60	120
dibenzo(ah)anthracene	10.0	7.4	74	60	120
Fluoranthene	2.5	1.9	76	60	120
Fluorene	5.0	3.4	68	60	120
Indeno(123cd)pyrene	2.5	1.9	76	60	120
Naphthalene	25.0	14.8	59	60	120
Phenanthrene	2.0	1.4	70	60	120
Pyrene	5.0	3.5	70	60	120

# Quality Control Report for Spike Analysis

## PAH's by HPLC

Matrix: Water

Analysis Date: 12/10/1998

Lab Sample ID: 98120066-1

Preparation Date: 12/09/1998

QC Batch ID: 9812PAH037

Method: EPA 8310

Spike Units: ug/l

Analyst: DC

Analyte	Spike Amount	Sample Result	Spike Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Acenaphthene	50.0	0.0	31.1	62	45	133
Acenaphthylene	25.0	0.0	16.9	68	45	133
Anthracene	1.0	0.0	0.9	88	45	133
Benzo(a)anthracene	2.5	0.0	2.2	88	45	133
Benzo(a)pyrene	2.5	0.0	2.2	88	45	133
Benzo(b)fluoranthene	1.0	0.0	0.9	89	45	133
Benzo(ghi)perylene	4.0	0.0	3.5	88	45	133
Benzo(k)fluoranthene	1.0	0.0	0.9	90	45	133
Chrysene	2.5	0.0	2.1	84	45	133
dibenzo(ah)anthracene	10.0	0.0	8.1	81	45	160
Fluoranthene	2.5	0.0	1.8	74	45	133
Fluorene	5.0	0.0	3.3	66	45	133
Indeno(123cd)pyrene	2.5	0.0	2.1	84	45	133
Naphthalene	25.0	0.0	15.7	63	45	133
Phenanthrene	2.0	0.0	1.3	67	45	133
Pyrene	5.0	0.0	3.4	68	45	133



PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

EDB/DBCP

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 12/03/1998  
ANALYTICAL PROTOCOL: EPA 504

Lab Reference Number : 98120026-1  
Client Sample ID : A902-GW-MW1-001  
Date Sampled : 12/02/1998  
Date Extracted : 12/03/1998  
Date Analyzed : 12/03/1998  
Sample Matrix (as Received): Water  
Analysis Confirmed : No  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
0.02	Ethylene dibromide (EDB)	0.02 U	ug/l	ELA
0.1	1,2-Dibromo-3-chloropropane	0.1 U	ug/l	ELA

U = Undetected. The value preceding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRs Certification # E83239/83353

Reviewed by : 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

EDB/DBCP

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 12/03/1998  
ANALYTICAL PROTOCOL: EPA 504

Lab Reference Number : 98120026-2  
Client Sample ID : A902-GW-MW2-001  
Date Sampled : 12/02/1998  
Date Extracted : 12/03/1998  
Date Analyzed : 12/03/1998  
Sample Matrix (as Received): Water  
Analysis Confirmed : No  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
0.02	Ethylene dibromide (EDB)	0.02 U	ug/l	ELA
0.1	1,2-Dibromo-3-chloropropane	0.1 U	ug/l	ELA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

EDB/DBCP

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 12/03/1998  
ANALYTICAL PROTOCOL: EPA 504

Lab Reference Number : 98120026-3  
Client Sample ID : A902-GW-MW7-001  
Date Sampled : 12/02/1998  
Date Extracted : 12/03/1998  
Date Analyzed : 12/03/1998  
Sample Matrix (as Received): Water  
Analysis Confirmed : No  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
0.02	Ethylene dibromide (EDB)	0.02 U	ug/l	ELA
0.1	1,2-Dibromo-3-chloropropane	0.1 U	ug/l	ELA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

# Quality Control Report for Method Blank

## EDB/DBCP

Matrix: Water

Lab Sample ID: RB-12-03-98

QC Batch ID: 9812EDB002

Result Units: ug/l

Analysis Date: 12/03/1998

Preparation Date: 12/03/1998

Method: EPA 504

Analyst: ELA

Analyte	Result	Flag	Analyte	Result	Flag
Ethylene dibromide (EDB)	0.02	U	1,2-Dibromo-3-chloropropane	0.1	U

# Quality Control Report for LCS/LCS Duplicate Analysis

## EDB/DBCP

Matrix: Water

Analysis Date: 12/03/1998

Lab Sample ID: LCS

Preparation Date: 12/03/1998

QC Batch ID: 9812EDB002

Method: EPA 504

LCS Units: ug/l

Analyst: ELA

Analyte	LCS Conc		LCS		LCSD		RPD
			Result	Percent Recovery	Result	Percent Recovery	
Ethylene dibromide (EDB)	1.00	0.00	1.07	107	0.99	99	8
1,2-Dibromo-3-chloropropane	1.0	0.0	1.1	110	1.0	102	8

### Quality Control Limits

Analyte	Quality Control Limits		RPD
	Lower Limit	Upper Limit	
Ethylene dibromide (EDB)	75	120	20
1,2-Dibromo-3-chloropropane	75	120	20

# Quality Control Report for Spike Analysis

## EDB/DBCP

Matrix: Water

Analysis Date: 12/03/1998

Lab Sample ID: 9812026-1

Preparation Date: 12/03/1998

QC Batch ID: 9812EDB002

Method: EPA 504

Spike Units: ug/l

Analyst: ELA

Analyte	Spike Amount	Sample Result	Spike Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Ethylene dibromide (EDB)	1.00	0.00	0.67	67	48	135
1,2-Dibromo-3-chloropropane	1.0	0.0	0.6	57	43	134

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Petroleum Hydrocarbons

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 12/03/1998  
ANALYTICAL PROTOCOL: FL-PRO

Lab Reference Number : 98120026-1  
Client Sample ID : A902-GW-MW1-001  
Date Sampled : 12/02/1998  
Date Extracted : 12/03/1998  
Date Analyzed : 12/03/1998  
Sample Matrix (as Received): Water  
Analysis Confirmed : No  
Dilution Factor : 5

MDL	Analyte	Results/Flag	Units	Analyst
0.5	Total PHS	10.8	mg/l	SGA
	(Surr) C-39 (%)	0 DL	%	SGA

U = Undetected. The value preceeding the "U" is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDLP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Petroleum Hydrocarbons

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 12/03/1998  
ANALYTICAL PROTOCOL: FL-PRO

Lab Reference Number : 98120026-2  
Client Sample ID : A902-GW-MW2-001  
Date Sampled : 12/02/1998  
Date Extracted : 12/03/1998  
Date Analyzed : 12/03/1998  
Sample Matrix (as Received): Water  
Analysis Confirmed : No  
Dilution Factor : 2

MDL	Analyte	Results/Flag	Units	Analyst
0.2	Total PHS	5.8	mg/l	SGA
	(Surr) C-39 (%)	83	%	SGA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 



PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Petroleum Hydrocarbons

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 12/03/1998  
ANALYTICAL PROTOCOL: FL-PRO

Lab Reference Number : 98120026-3  
Client Sample ID : A902-GW-MW7-001  
Date Sampled : 12/02/1998  
Date Extracted : 12/03/1998  
Date Analyzed : 12/03/1998  
Sample Matrix (as Received): Water  
Analysis Confirmed : No  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
0.1	Total PHS	0.3	mg/l	SGA
	(Surr) C-39 (%)	63	%	SGA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FL DEP Comp QAPP # 900134G - FHRs Certification # E83239/83353

Reviewed by : 

# Quality Control Report for Method Blank

## Petroleum Hydrocarbons

Matrix: Water

Analysis Date: 12/03/1998

Lab Sample ID: RB-12-03-98

Preparation Date: 12/03/1998

QC Batch ID: 9812FLRO011

Method: FL-PRO

Result Units: mg/l

Analyst: SGA

Analyte	Result	Flag	Analyte	Result	Flag
Total PHS	0.1	U	(Surr) C-39 (%)	100.0	

# Quality Control Report for LCS/LCS Duplicate Analysis

## Petroleum Hydrocarbons

Matrix: Water

Analysis Date: 12/03/1998

Lab Sample ID: LCS

Preparation Date: 12/03/1998

QC Batch ID: 9812FLRO011

Method: FL-PRO

LCS Units: mg/l

Analyst: SGA

Analyte	LCS		LCS		LCSD		RPD
	Conc		Result	Percent Recovery	Result	Percent Recovery	
(Surr) C-39	100.0	0.0	94.0	94	92.0	92	2
Total PHS	5.0	0.0	3.5	70	3.5	70	0

Analyte	Quality Control Limits		RPD
	Lower Limit	Upper Limit	
SS_C-39	4	140	31
Total PHS	57	110	11

# Quality Control Report for Spike/Spike Duplicate Analysis

## Petroleum Hydrocarbons

Matrix: Water

Lab Sample ID: 9811188-1

QC Batch ID: 9812FLRO011

Spike Units: mg/l

Analysis Date: 12/03/1998

Preparation Date: 12/03/1998

Method: FL-PRO

Analyst: SGA

Analyte	Spike Amount	Sample Result	Spike Result	Spike Percent Recovery	MSD Result	MSD Percent Recovery	RPD
(Surr) C-39	100.0	0.0	106.0	106	96.0	96	10
Total PHS	5.0	0.0	3.9	78	3.9	78	0

### Quality Control Limits

Analyte	Lower Limit	Upper Limit	RPD
SS_C-39	7	139	30
Total PHS	57	110	11

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194

Report of Analysis

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 12/03/1998

Lab Reference Number : 98120026-1  
Client Sample ID : A902-GW-MW1-001  
Date Sampled : 12/02/1998  
Sample Matrix (as Received): Water

Method	Parameter	Results/Flag	Units	Analyst	Date Prep	Date Anal	MDL
EPA 6010	Lead, Total	4	ug/l	GG	12/07/1998	12/08/1998	3

U = Undetected. The value preceeding the 'U' is the MDL for the analyte. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194

Report of Analysis

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 12/03/1998

Lab Reference Number : 98120026-2  
Client Sample ID : A902-GW-MW2-001  
Date Sampled : 12/02/1998  
Sample Matrix (as Received): Water

Method	Parameter	Results/Flag	Units	Analyst	Date Prep	Date Anal	MDL
EPA 6010	Lead, Total	3 U	ug/l	GG	12/07/1998	12/08/1998	3

U = Undetected. The value preceeding the "U" is the MDL for the analyte. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194

Report of Analysis

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 12/03/1998

Lab Reference Number : 98120026-3  
Client Sample ID : A902-GW-MW7-001  
Date Sampled : 12/02/1998  
Sample Matrix (as Received): Water

Method	Parameter	Results/Flag	Units	Analyst	Date Prep	Date Anal	MDL
EPA 6010	Lead, Total	9	ug/l	GG	12/07/1998	12/08/1998	3

U = Undetected. The value preceeding the 'U' is the MDL for the analyte. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

# Quality Control Report for Method Blank

## INORGANICS

Analyte	Units	Result	Flag	QC Batch ID	Analyst
Method: EPA 6010	QC Batch: 9812RC031	Sample ID: RB-12-08-98	Date Prep: 12/07/1998	Date Anal: 12/08/1998	Analyst: GG
Lead, Total	ug/l	3	U	9812RC031	GG



# Quality Control Report for LCS Analysis

## INORGANICS

Analyte		LCS Conc		LCS Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Method: EPA 6010	QC Batch: 9812RC031	Sample ID: LCS	Date Prep: 12/07/1998	Date Anal: 12/08/1998	Analyst: GG		
Lead, Total		100 ug/l	0	105	105	85	117

# Quality Control Report for Duplicate Analysis

## INORGANICS

Analyte		Sample Result	Dupe Result	RPD	Control Limit
Method: EPA 6010	QC Batch: 9812RC031	Sample ID: 98120026-2	Date Prep: 12/07/1998	Date Anal: 12/08/1998	Analyst: GG
Lead, Total		ug/l	0	0	25

# Quality Control Report for Spike Analysis

## INORGANICS

Analyte		Spike Amount	Sample Result	Spike Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Method: EPA 6010	QC Batch: 9812RC031	Sample ID: 9812026-2	Date Prep: 12/07/1998	Date Anal: 12/08/1998	Analyst: GG		
Lead, Total		100 ug/l	0	95	95	78	115

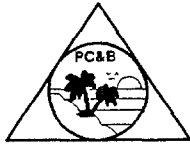
210 Park Road, Oviedo, FL 32765  
407-359-7194 (FAX) 407-359-7197

## Chain of Custody

**Work Order:** 98/20026

Date: 12/2/98 Page        of       

COMPANY: TETRA TECH NUS, INC				ANALYSIS REQUESTED																				
ADDRESS: TALLAHASSEE, FL																								
SAMPLED BY: RICK BARKER / SIGN: [Signature]																								
PHONE: 850 656-5458 FAX:																								
#	SAMPLE ID	DATE/TIME	MATRIX					PRESERVATION																
			AIR	WATER	SLUDGE	SOIL/SOLID	ORG. LIQUID																	
1	A902-GW-MW1-001	12.2.98/ 850	X					Hcl	none	Hcl	HNO3	Hcl												
2	A902-GW-MW2-001	12.2.98/ 163	X					2	1	2	1	1												
3	A902-GW-MW7-001	12.2.98/ 1716	X					2	1	2	1	1												
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
RELINQUISHED BY			DATE/TIME		RECEIVED BY			DATE/TIME		PROJECT INFORMATION							SAMPLE RECEIPT							
1: [Signature]			11/23/98		1: [Signature]			11/26/98		PROJECT NAME: TRUCK FILL STAND							Total # of Containers							
2: [Signature]			12/2/98 1800		2: [Signature]			12/3/98		PROJECT #: 7586							Chain of Custody Seals							
3:					3:					SITE ADDRESS: NAS KEY WEST							Recv'd in Good Condition							
SPECIAL INSTRUCTIONS/COMMENTS: Q1088								PROJECT MANAGER: PAUL CALLIGAN							PO #:									
								INVOICE TO: (IF DIFFERENT FROM ABOVE)																
QUOTE/CONTRACT																								



## PC&B Environmental Laboratories, Inc.

210 Park Road, Oviedo, Florida 32765  
Phone: 407-359-7194 Fax: 407-359-7197

---

02-15-1999

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

Dear Paul Calligan:

Enclosed are the results of the analysis of your samples received 09/01/1998.

Our laboratory is certified by the Florida DHRS (Lab #E83239) and operates under an FDEP approved Comprehensive Quality Assurance Plan (#900134G). Unless otherwise noted, all results are reported as received. All data were determined in accordance with published procedures (EPA-600/4-79-020), Methods for Chemical Analysis of Water and Wastes, Revised March 1983 and/or Standard Methods for the examination of Water and Wastewater, 18th Edition 1989 and/or Test Methods for Evaluating Solid Waste (EPA-SW-846, Revised January 1995), unless stated otherwise in our CompQapp under method modifications.

If you have any questions, please do not hesitate to give me a call.

Sincerely,

Beckie J. Burdick  
Laboratory Manager



## PC&B Environmental Laboratories, Inc.

210 Park Road, Oviedo, Florida 32765  
Phone: 407-359-7194 Fax: 407-359-7197

Client : Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

Contact : Paul Calligan  
Phone : (850) 656-5458

**Laboratory Reference Number : 98090003**

Project Name : NAS Key West

Project Number : 7586

Chain of Custody : 3145

Sample temperature at time of receipt: 4 degrees C

Laboratory ID	Matrix	Client ID	Status	Date/Time Sampled
98090003-1	Water	A9OZ-GW-MW07	RUN	08/28/1998 17:00
98090003-2	Water	A9OZ-GW-MW06	RUN	08/29/1998 10:45
98090003-3	Water	A9OZ-GW-MW03	RUN	08/29/1998 12:30
98090003-4	Water	A9OZ-GW-MW05	RUN	08/29/1998 15:30
98090003-5	Water	A9OZ-GW-MW04	RUN	08/29/1998 16:25
98090003-6	Water	A9OZ-GW-MW02	RUN	08/29/1998 17:25
98090003-7	Water	A9OZ-GW-MWD08	RUN	08/30/1998 11:20
98090003-8	Water	A9OZ-GW-MW01	RUN	08/30/1998 12:30
98090003-9	Water	A9OZ-GW-DUP	RUN	08/30/1998
98090003-10	Water	A9OZ-GW-EQ	RUN	08/30/1998 12:20
98090003-11	Water	A9OZ-T.B.	RUN	08/30/1998

Number	Parameter	Description
11	Group Test	EPA 601/602 Volatile Organics
10	EPA 504	EDB/DBCP
3	SOP 3.50	Light Hydrocarbons in Water
10	EPA 8310	PAH's by HPLC
10	FL-PRO	Petroleum Hydrocarbons
10	EPA 6010	Lead by ICAP
3	EPA 353.3	Nitrate
3	EPA 354.1	Nitrite
3	EPA 375.4	Sulfate

# PC&B Environmental Laboratories, Inc.

210 Park Road  
Oviedo, FL 32765  
407-359-7194 - (FAX) 359-7197

---

## Case Narrative

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

CASE NARRATIVE for Work Order: 98090003  
Project Number: 7586  
Project Name: NAS Key West

This Case Narrative is a summary of events and/or problems encountered with this Work Order.

Due to high levels of hydrocarbons in the samples the HPLC 8310 analysis for PAH's was unusable. The 8310 PAH samples were analysed by the GC 8100 method.

### Definition of Flags

DL	=	No surrogate result due to dilution or matrix interference.
J	=	Estimated Value, value not accurate.
L	=	Off-scale high. Actual value is greater than value given.
Q	=	Sample held beyond the accepted holding time.
T	=	Value reported is less than the laboratory method detection limit.
V	=	Analyte was both detected in the method blank and sample.

## QC Batch Summary

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

QC BATCH SUMMARY for Work Order: 98090003  
Project Number: 7586  
Project Name: NAS Key West

Method	SubNum	QC Batch
<b>EPA 602/8021 - Aromatic Volatile Organics</b>		
	-1	9809MS2002
	-2	9809MS2002
	-3	9809MS2002
	-4	9809MS2002
	-5	9809MS2002
	-6	9809MS2002
	-7	9809MS2002
	-8	9809MS2002
	-9	9809MS2002
	-10	9809MS2002
	-11	9809MS2002
<b>EPA 504 - EDB/DBCP</b>		
	-1	9809EDB002
	-2	9809EDB002
	-3	9809EDB002
	-4	9809EDB002
	-5	9809EDB002
	-6	9809EDB002
	-7	9809EDB002
	-8	9809EDB002
	-9	9809EDB002
	-10	9809EDB002
<b>EPA 601/8021 - Halogenated Volatile Organics</b>		
	-1	9809MS2002
	-2	9809MS2002
	-3	9809MS2002
	-4	9809MS2002
	-5	9809MS2002
	-6	9809MS2002
	-7	9809MS2002
	-8	9809MS2002



## QC Batch Summary

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

QC BATCH SUMMARY for Work Order: 98090003  
Project Number: 7586  
Project Name: NAS Key West

Method	SubNum	QC Batch
	-9	9809MS2002
	-10	9809MS2002
	-11	9809MS2002
<b>EPA 6010 - Lead by ICAP</b>		
	-1	9809RC024
	-2	9809RC024
	-3	9809RC024
	-4	9809RC024
	-5	9809RC024
	-6	9809RC024
	-7	9809RC024
	-8	9809RC024
	-9	9809RC024
	-10	9809RC024
<b>SOP 3.50 - Light Hydrocarbons in Water</b>		
	-2	QC0722
	-3	QC0722
	-4	QC0722
<b>EPA 353.3 - Nitrate</b>		
	-2	9809NO3015
	-3	9809NO3015
	-4	9809NO3015
<b>EPA 354.1 - Nitrite</b>		
	-2	9809NO2006
	-3	9809NO2006
	-4	9809NO2006
<b>EPA 8310 - PAH's by HPLC</b>		
	-1	9809PAH008
	-2	9809PAH008
	-3	9809PAH008
	-4	9809PAH008
	-5	9809PAH008

---

## QC Batch Summary

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

QC BATCH SUMMARY for Work Order: 98090003  
Project Number: 7586  
Project Name: NAS Key West

Method	SubNum	QC Batch
	-6	9809PAH008
	-7	9809PAH008
	-8	9809PAH008
	-9	9809PAH008
	-10	9809PAH008
<b>FL-PRO - Petroleum Hydrocarbons</b>		
	-1	9809FLRO011
	-2	9809FLRO011
	-3	9809FLRO011
	-4	9809FLRO011
	-5	9809FLRO011
	-6	9809FLRO011
	-7	9809FLRO011
	-8	9809FLRO011
	-9	9809FLRO011
	-10	9809FLRO011
<b>EPA 375.4 - Sulfate</b>		
	-2	9809SO4009
	-3	9809SO4009
	-4	9809SO4009

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Aromatic Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER: 7586  
DATE RECEIVED: 09/01/1998  
ANALYTICAL PROTOCOL: EPA 602/8021

Lab Reference Number	98090003-1	98090003-2	98090003-3	98090003-4	98090003-5
Client Sample ID	A9OZ-GW-MW07	A9OZ-GW-MW06	A9OZ-GW-MW03	A9OZ-GW-MW05	A9OZ-GW-MW04
Date Sampled	08/28/1998	08/29/1998	08/29/1998	08/29/1998	08/29/1998
Date Extracted	09/01/1998	09/01/1998	09/01/1998	09/01/1998	09/01/1998
Date Analyzed	09/01/1998	09/01/1998	09/01/1998	09/01/1998	09/01/1998
Sample Matrix (as Received)	Water	Water	Water	Water	Water
Analysis Confirmed	GCMS	GCMS	GCMS	GCMS	GCMS
Dilution Factor	1	1	1	1	1
Result Units	ug/l	ug/l	ug/l	ug/l	ug/l
Benzene	25.6	1.0 U	1.0 U	1.0 U	1.7
Chlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	38.4	1.0 U	1.0 U	1.0 U	1.0 U
MTBE	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Toluene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
m & p-Xylenes	2.5	1.0 U	1.0 U	1.0 U	1.0 U
o-Xylene	1.0 U	1.0 U	1.0 U	1.5	1.0 U

U = Undetected. The value preceding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Aromatic Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER: 7586  
DATE RECEIVED: 09/01/1998  
ANALYTICAL PROTOCOL: EPA 602/8021

Lab Reference Number	98090003-6	98090003-7	98090003-8	98090003-9	98090003-10
Client Sample ID	A9OZ-GW-MW02	A9OZ-GW-MWD08	A9OZ-GW-MW01	A9OZ-GW-DUP	A9OZ-GW-EQ
Date Sampled	08/29/1998	08/30/1998	08/30/1998	08/30/1998	08/30/1998
Date Extracted	09/01/1998	09/01/1998	09/01/1998	09/01/1998	09/01/1998
Date Analyzed	09/01/1998	09/01/1998	09/01/1998	09/01/1998	09/01/1998
Sample Matrix (as Received)	Water	Water	Water	Water	Water
Analysis Confirmed	GCMS	GCMS	GCMS	GCMS	GCMS
Dilution Factor	1	1	1	1	1
Result Units	ug/l	ug/l	ug/l	ug/l	ug/l
Benzene	3.5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MTBE	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Toluene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
m & p-Xylenes	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
o-Xylene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by :



PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Aromatic Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER: 7586  
DATE RECEIVED: 09/01/1998  
ANALYTICAL PROTOCOL: EPA 602/8021

Lab Reference Number	98090003-11
Client Sample ID	A9OZ-T.B.
Date Sampled	08/30/1998
Date Extracted	09/01/1998
Date Analyzed	09/01/1998
Sample Matrix (as Received)	Water
Analysis Confirmed	GCMS
Dilution Factor	1
Result Units	ug/l
Benzene	1.0 U
Chlorobenzene	1.0 U
1,2-Dichlorobenzene	1.0 U
1,3-Dichlorobenzene	1.0 U
1,4-Dichlorobenzene	1.0 U
Ethylbenzene	1.0 U
MTBE	5.0 U
Toluene	1.0 U
m & p-Xylenes	1.0 U
o-Xylene	1.0 U

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

# Quality Control Report for Spike/Spike Duplicate Analysis

## Aromatic Volatile Organics

Matrix: Water

Lab Sample ID: MW-QC

QC Batch ID: 9809MS2002

Spike Units: ug/l

Analysis Date: 09/01/1998

Preparation Date: 09/01/1998

Method: EPA 602

Analyst: NM

Analyte	Spike Amount	Sample Result	Spike Result	Spike Percent Recovery	MSD Result	MSD Percent Recovery	RPD
Benzene	50.0	0.0	57.0	114	59.0	118	3
Ethylbenzene	50.0	0.0	54.0	108	53.0	106	2
MTBE	50.0	0.0	56.0	112	61.0	122	9
Toluene	50.0	0.0	58.0	116	58.0	116	0
m & p-Xylenes	100.0	0.0	104.0	104	100.0	100	4
o-Xylene	50.0	0.0	53.0	106	51.0	102	4

### Quality Control Limits

Analyte	Lower Limit	Upper Limit	RPD
Benzene	60	144	14
Ethylbenzene	68	133	18
MTBE	58	140	18
Toluene	66	130	15
m & p-Xylenes	68	128	16
o-Xylene	50	131	15

# Quality Control Report for LCS/LCS Duplicate Analysis

## Aromatic Volatile Organics

Matrix: Water

Lab Sample ID: LCS

QC Batch ID: 9809MS2002

LCS Units: ug/l

Analysis Date: 09/01/1998

Preparation Date: 09/01/1998

Method: EPA 602

Analyst: NM

Analyte	LCS Conc		LCS Result	LCS Percent Recovery	LCSD Result	LCSD Percent Recovery	RPD
Benzene	25.0	0.0	27.0	108	26.0	104	4
Ethylbenzene	25.0	0.0	29.0	116	29.0	116	0
MTBE	25.0	0.0	24.0	96	25.0	100	4
Toluene	25.0	0.0	27.0	108	27.0	108	0
m & p-Xylenes	50.0	0.0	59.0	118	57.0	114	3
o-Xylene	25.0	0.0	30.0	120	29.0	116	3

### Quality Control Limits

Analyte	Lower Limit	Upper Limit	RPD
Benzene	52	148	4
Ethylbenzene	50	143	7
MTBE	51	154	7
Toluene	46	152	5
m & p-Xylenes	44	146	6
o-Xylene	47	146	5

# Quality Control Report for Method Blank

## Aromatic Volatile Organics

Matrix: Water

Analysis Date: 09/01/1998

Lab Sample ID: RB-09-01-98

Preparation Date: 09/01/1998

QC Batch ID: 9809MS2002

Method: EPA 602

Result Units: ug/l

Analyst: NM

Analyte	Result	Flag	Analyte	Result	Flag
Benzene	1.0	U	Chlorobenzene	1.0	U
1,2-Dichlorobenzene	1.0	U	1,3-Dichlorobenzene	1.0	U
1,4-Dichlorobenzene	1.0	U	Ethylbenzene	1.0	U
MTBE	5.0	U	Toluene	1.0	U
m & p-Xylenes	1.0	U	o-Xylene	1.0	U



PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

EDB/DBCP

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER: 7586  
DATE RECEIVED: 09/01/1998  
ANALYTICAL PROTOCOL: EPA 504

Lab Reference Number	98090003-1	98090003-2	98090003-3	98090003-4	98090003-5
Client Sample ID	A9OZ-GW-MW07	A9OZ-GW-MW06	A9OZ-GW-MW03	A9OZ-GW-MW05	A9OZ-GW-MW04
Date Sampled	08/28/1998	08/29/1998	08/29/1998	08/29/1998	08/29/1998
Date Extracted	09/03/1998	09/03/1998	09/03/1998	09/03/1998	09/03/1998
Date Analyzed	09/03/1998	09/03/1998	09/03/1998	09/03/1998	09/03/1998
Sample Matrix (as Received)	Water	Water	Water	Water	Water
Analysis Confirmed	No	No	No	No	No
Dilution Factor	1	1	1	1	1
Result Units	ug/l	ug/l	ug/l	ug/l	ug/l
Ethylene dibromide (EDB)	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
1,2-Dibromo-3-chloropropane	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

EDB/DBCP

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER: 7586  
DATE RECEIVED: 09/01/1998  
ANALYTICAL PROTOCOL: EPA 504

Lab Reference Number	98090003-6	98090003-7	98090003-8	98090003-9	98090003-10
Client Sample ID	A9OZ-GW-MW02	A9OZ-GW-MWD08	A9OZ-GW-MW01	A9OZ-GW-DUP	A9OZ-GW-EQ
Date Sampled	08/29/1998	08/30/1998	08/30/1998	08/30/1998	08/30/1998
Date Extracted	09/03/1998	09/03/1998	09/03/1998	09/03/1998	09/03/1998
Date Analyzed	09/03/1998	09/03/1998	09/03/1998	09/03/1998	09/03/1998
Sample Matrix (as Received)	Water	Water	Water	Water	Water
Analysis Confirmed	No	No	No	No	No
Dilution Factor	1	1	1	1	1
Result Units	ug/l	ug/l	ug/l	ug/l	ug/l
Ethylene dibromide (EDB)	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
1,2-Dibromo-3-chloropropane	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

# Quality Control Report for Spike Analysis

## EDB/DBCP

Matrix: Water

Lab Sample ID: 9809003-2

QC Batch ID: 9809EDB002

Spike Units: ug/l

Analysis Date: 09/03/1998

Preparation Date: 09/03/1998

Method: EPA 504

Analyst: ELA

Analyte	Spike Amount	Sample Result	Spike Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Ethylene dibromide (EDB)	1.00	0.00	0.83	83	48	135
1,2-Dibromo-3-chloropropane	1.0	0.0	0.9	86	43	134

# Quality Control Report for LCS/LCS Duplicate Analysis

## EDB/DBCP

Matrix: Water

Lab Sample ID: LCS

QC Batch ID: 9809EDB002

LCS Units: ug/l

Analysis Date: 09/03/1998

Preparation Date: 09/03/1998

Method: EPA 504

Analyst: ELA

Analyte	LCS Conc		LCS Result	LCS Percent Recovery	LCSD Result	LCSD Percent Recovery	RPD
Ethylene dibromide (EDB)	1.00	0.00	0.85	85	0.78	78	9
1,2-Dibromo-3-chloropropane	1.0	0.0	0.9	85	0.8	78	9

### Quality Control Limits

Analyte	Lower Limit	Upper Limit	RPD
Ethylene dibromide (EDB)	75	120	20
1,2-Dibromo-3-chloropropane	75	120	20

# Quality Control Report for Method Blank

## EDB/DBCP

Matrix: Water

Lab Sample ID: RB-09-03-98

QC Batch ID: 9809EDB002

Result Units: ug/l

Analysis Date: 09/03/1998

Preparation Date: 09/03/1998

Method: EPA 504

Analyst: ELA

Analyte	Result	Flag	Analyte	Result	Flag
Ethylene dibromide (EDB)	0.02	U	1,2-Dibromo-3-chloropropane	0.1	U

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Halogenated Volatile Organics

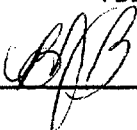
CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER: 7586  
DATE RECEIVED: 09/01/1998  
ANALYTICAL PROTOCOL: EPA 601/8021

Lab Reference Number	98090003-1	98090003-2	98090003-3	98090003-4	98090003-5
Client Sample ID	A9OZ-GW-MW07	A9OZ-GW-MW06	A9OZ-GW-MW03	A9OZ-GW-MW05	A9OZ-GW-MW04
Date Sampled	08/28/1998	08/29/1998	08/29/1998	08/29/1998	08/29/1998
Date Extracted	09/01/1998	09/01/1998	09/01/1998	09/01/1998	09/01/1998
Date Analyzed	09/01/1998	09/01/1998	09/01/1998	09/01/1998	09/01/1998
Sample Matrix (as Received)	Water	Water	Water	Water	Water
Analysis Confirmed	GCMS	GCMS	GCMS	GCMS	GCMS
Dilution Factor	1	1	1	1	1
Result Units	ug/l	ug/l	ug/l	ug/l	ug/l
Bromobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Chloroethyl vinyl ether	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromomethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	1.4 V	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,1,2-Tetrachloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,1-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,3-Trichloropropane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRs Certification # E83239/83353

Reviewed by :



PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Halogenated Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER: 7586  
DATE RECEIVED: 09/01/1998  
ANALYTICAL PROTOCOL: EPA 601/8021

Lab Reference Number	98090003-6	98090003-7	98090003-8	98090003-9	98090003-10
Client Sample ID	A90Z-GW-MW02	A90Z-GW-MWD08	A90Z-GW-MW01	A90Z-GW-DUP	A90Z-GW-EQ
Date Sampled	08/29/1998	08/30/1998	08/30/1998	08/30/1998	08/30/1998
Date Extracted	09/01/1998	09/01/1998	09/01/1998	09/01/1998	09/01/1998
Date Analyzed	09/01/1998	09/01/1998	09/01/1998	09/01/1998	09/01/1998
Sample Matrix (as Received)	Water	Water	Water	Water	Water
Analysis Confirmed	GCMS	GCMS	GCMS	GCMS	GCMS
Dilution Factor	1	1	1	1	1
Result Units	ug/l	ug/l	ug/l	ug/l	ug/l
Bromobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Chloroethyl vinyl ether	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromomethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	1.0 U	1.0 U	1.0 U	1.0 U	1.2 V
1,1,2,2-Tetrachloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,1,2-Tetrachloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,1-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,3-Trichloropropane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRs Certification # E83239/83353

Reviewed by: 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Halogenated Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER: 7586  
DATE RECEIVED: 09/01/1998  
ANALYTICAL PROTOCOL: EPA 601/8021

Lab Reference Number	98090003-11
Client Sample ID	A9OZ-T.B.
Date Sampled	08/30/1998
Date Extracted	09/01/1998
Date Analyzed	09/01/1998
Sample Matrix (as Received)	Water
Analysis Confirmed	GCMS
Dilution Factor	1
Result Units	ug/l
Bromobenzene	1.0 U
Bromodichloromethane	1.0 U
Bromoform	1.0 U
Bromomethane	1.0 U
Carbon tetrachloride	1.0 U
Chlorobenzene	1.0 U
Chloroethane	1.0 U
2-Chloroethyl vinyl ether	1.0 U
Chloroform	1.0 U
Chloromethane	1.0 U
Dibromochloromethane	1.0 U
Dibromomethane	1.0 U
1,2-Dichlorobenzene	1.0 U
1,3-Dichlorobenzene	1.0 U
1,4-Dichlorobenzene	1.0 U
1,1-Dichloroethane	1.0 U
Dichlorodifluoromethane	1.0 U
1,2-Dichloroethane	1.0 U
1,1-Dichloroethene	1.0 U
trans-1,2-Dichloroethene	1.0 U
1,2-Dichloropropane	1.0 U
cis-1,3-Dichloropropene	1.0 U
trans-1,3-Dichloropropene	1.0 U
Methylene chloride	2.7 V
1,1,2,2-Tetrachloroethane	1.0 U
1,1,1,2-Tetrachloroethane	1.0 U
Tetrachloroethene	1.0 U
1,1,1-Trichloroethane	1.0 U
1,1,2-Trichloroethane	1.0 U
Trichloroethene	1.0 U
Trichlorofluoromethane	1.0 U
1,2,3-Trichloropropane	1.0 U
Vinyl chloride	1.0 U
cis-1,2-Dichloroethene	1.0 U

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRs Certification # E83239/83353

Reviewed by : 



# Quality Control Report for Spike/Spike Duplicate Analysis

## Halogenated Volatile Organics

Matrix: Water

Lab Sample ID: MW-QC

QC Batch ID: 9809MS2002

Spike Units: ug/l

Analysis Date: 09/01/1998

Preparation Date: 09/01/1998

Method: EPA 601

Analyst: NM

Analyte	Spike Amount	Sample Result	Spike Result	Spike Percent Recovery	MSD Result	MSD Percent Recovery	RPD
Carbon tetrachloride	50.0	0.0	51.0	102	52.0	104	2
Chlorobenzene	50.0	0.0	55.0	110	54.0	108	2
1,4-Dichlorobenzene	50.0	0.0	54.0	108	56.0	112	4
1,1-Dichloroethene	50.0	0.0	58.0	116	57.0	114	2
Trichloroethene	50.0	0.0	58.0	116	60.0	120	3

### Quality Control Limits

Analyte	Lower Limit	Upper Limit	RPD
Carbon tetrachloride	66	134	11
Chlorobenzene	69	127	15
1,4-Dichlorobenzene	69	134	11
1,1-Dichloroethene	60	132	15
Trichloroethene	68	129	15

# Quality Control Report for LCS/LCS Duplicate Analysis

## Halogenated Volatile Organics

Matrix: Water

Lab Sample ID: LCS

QC Batch ID: 9809MS2002

LCS Units: ug/l

Analysis Date: 09/01/1998

Preparation Date: 09/01/1998

Method: EPA 601

Analyst: NM

Analyte	LCS		LCS		LCSD		RPD
	Conc		Result	Percent Recovery	Result	Percent Recovery	
Carbon tetrachloride	25.0	0.0	21.0	84	20.0	80	5
Chlorobenzene	25.0	0.0	29.0	116	29.0	116	0
1,4-Dichlorobenzene	25.0	0.0	27.0	108	27.0	108	0
1,1-Dichloroethene	25.0	0.0	23.0	92	23.0	92	0
Trichloroethene	25.0	0.0	25.0	100	26.0	104	4

### Quality Control Limits

Analyte	Lower Limit	Upper Limit	RPD
Carbon tetrachloride	51	134	4
Chlorobenzene	59	147	4
1,4-Dichlorobenzene	57	145	4
1,1-Dichloroethene	46	150	7
Trichloroethene	48	148	6

# Quality Control Report for Method Blank

## Halogenated Volatile Organics

Matrix: Water

Lab Sample ID: RB-09-01-98

QC Batch ID: 9809MS2002

Result Units: ug/l

Analysis Date: 09/01/1998

Preparation Date: 09/01/1998

Method: EPA 601

Analyst: NM

Analyte	Result	Flag	Analyte	Result	Flag
Bromobenzene	1.0	U	Bromodichloromethane	1.0	U
Bromoform	1.0	U	Bromomethane	1.0	U
Carbon tetrachloride	1.0	U	Chlorobenzene	1.0	U
Chloroethane	1.0	U	2-Chloroethyl vinyl ether	1.0	U
Chloroform	1.0	U	Chloromethane	1.0	U
Dibromochloromethane	1.0	U	Dibromomethane	1.0	U
1,2-Dichlorobenzene	1.0	U	1,3-Dichlorobenzene	1.0	U
1,4-Dichlorobenzene	1.0	U	1,1-Dichloroethane	1.0	U
Dichlorodifluoromethane	1.0	U	1,2-Dichloroethane	1.0	U
1,1-Dichloroethene	1.0	U	trans-1,2-Dichloroethene	1.0	U
1,2-Dichloropropane	1.0	U	cis-1,3-Dichloropropene	1.0	U
trans-1,3-Dichloropropene	1.0	U	Methylene chloride	9.4	
1,1,2,2-Tetrachloroethane	1.0	U	1,1,1,2-Tetrachloroethane	1.0	U
Tetrachloroethene	1.0	U	1,1,1-Trichloroethane	1.0	U
1,1,2-Trichloroethane	1.0	U	Trichloroethene	1.0	U
Trichlorofluoromethane	1.0	U	1,2,3-Trichloropropane	1.0	U
Vinyl chloride	1.0	U	cis-1,2-Dichloroethene	1.0	U

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Light Hydrocarbons in Water

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER: 7586  
DATE RECEIVED: 09/01/1998  
ANALYTICAL PROTOCOL: SOP 3.50

Lab Reference Number	98090003-2	98090003-3	98090003-4
Client Sample ID	A9OZ-GW-MW06	A9OZ-GW-MW03	A9OZ-GW-MW05
Date Sampled	08/29/1998	08/29/1998	08/29/1998
Date Extracted	09/04/1998	09/04/1998	09/04/1998
Date Analyzed	09/04/1998	09/04/1998	09/04/1998
Sample Matrix (as Received)	Water	Water	Water
Analysis Confirmed	No	No	No
Dilution Factor	1	1	1
Result Units	mg/l	mg/l	mg/l
Methane	0.480	0.282	0.144
Ethane	0.001 U	0.001 U	0.001 U
Ethene	0.001 U	0.001 U	0.001 U

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by: 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

PAH's by HPLC

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER: 7586  
DATE RECEIVED: 09/01/1998  
ANALYTICAL PROTOCOL: EPA 8310

Lab Reference Number	98090003-1	98090003-2	98090003-3	98090003-4	98090003-5
Client Sample ID	A9OZ-GW-MW07	A9OZ-GW-MW06	A9OZ-GW-MW03	A9OZ-GW-MW05	A9OZ-GW-MW04
Date Sampled	08/28/1998	08/29/1998	08/29/1998	08/29/1998	08/29/1998
Date Extracted	09/02/1998	09/02/1998	09/02/1998	09/02/1998	09/02/1998
Date Analyzed	09/04/1998	09/04/1998	09/04/1998	09/04/1998	09/04/1998
Sample Matrix (as Received)	Water	Water	Water	Water	Water
Analysis Confirmed	Yes	Yes	Yes	Yes	Yes
Dilution Factor	1	1	1	1	1
Result Units	ug/l	ug/l	ug/l	ug/l	ug/l
Acenaphthene	5 U	5 U	5 U	5 U	5 U
Acenaphthylene	5 U	6	5 U	5 U	5 U
Anthracene	5 U	5 U	5 U	5 U	5 U
Benzo(a)anthracene	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Benzo(a)pyrene	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
Benzo(b)fluoranthene	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Benzo(ghi)perylene	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Benzo(k)fluoranthene	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
Chrysene	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
dibenzo(ah)anthracene	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Fluoranthene	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
Fluorene	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
Indeno(123cd)pyrene	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
Naphthalene	5.00 U	5.00 U	5.00 U	5.00 U	17.10
1-Methyl naphthalene	5.00 U	5.00 U	5.00 U	5.00 U	50.0
2-Methyl naphthalene	5.00 U	5.00 U	5.00 U	6.80	48.00
Phenanthrene	5.000 U	5.000 U	5.000 U	5.000 U	5.000 U
Pyrene	5.000 U	5.000 U	5.000 U	5.000 U	5.000 U

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by :



PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

PAH's by HPLC

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER: 7586  
DATE RECEIVED: 09/01/1998  
ANALYTICAL PROTOCOL: EPA 8310

Lab Reference Number	98090003-6	98090003-7	98090003-8	98090003-9	98090003-10
Client Sample ID	A90Z-GW-MW02	A90Z-GW-MWD08	A90Z-GW-MW01	A90Z-GW-DUP	A90Z-GW-EQ
Date Sampled	08/29/1998	08/30/1998	08/30/1998	08/30/1998	08/30/1998
Date Extracted	09/02/1998	09/02/1998	09/02/1998	09/02/1998	09/02/1998
Date Analyzed	09/04/1998	09/04/1998	09/04/1998	09/04/1998	09/04/1998
Sample Matrix (as Received)	Water	Water	Water	Water	Water
Analysis Confirmed	Yes	Yes	Yes	Yes	Yes
Dilution Factor	1	1	2	2	1
Result Units	ug/l	ug/l	ug/l	ug/l	ug/l
Acenaphthene	14	5 U	28	28	5 U
Acenaphthylene	13	5 U	20	18	5 U
Anthracene	5 U	5 U	10 U	10 U	5 U
Benzo(a)anthracene	5.0 U	5.0 U	10.0 U	10.0 U	5.0 U
Benzo(a)pyrene	5.00 U	5.00 U	10.00 U	10.00 U	5.00 U
Benzo(b)fluoranthene	5.0 U	5.0 U	10.0 U	10.0 U	5.0 U
Benzo(ghi)perylene	5.0 U	5.0 U	10.0 U	10.0 U	5.0 U
Benzo(k)fluoranthene	5.00 U	5.00 U	10.00 U	10.00 U	5.00 U
Chrysene	5.00 U	5.00 U	10.00 U	10.00 U	5.00 U
dibenzo(ah)anthracene	5.0 U	5.0 U	10.0 U	10.0 U	5.0 U
Fluoranthene	5.00 U	5.00 U	10.00 U	10.00 U	5.00 U
Fluorene	5.00 U	5.00 U	18.00	18.00	5.00 U
Indeno(123cd)pyrene	5.00 U	5.00 U	10.00 U	10.00 U	5.00 U
Naphthalene	11.10	8.80	130	160	5.00 U
1-Methyl naphthalene	13.00	16.00	180	190	5.00 U
2-Methyl naphthalene	58.0	15.00	130	135	5.00 U
Phenanthrene	5.000 U	5.000 U	10.000 U	10.000 U	5.000 U
Pyrene	5.000 U	5.000 U	10.000 U	10.000 U	5.000 U

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRs Certification # E83239/83353

Reviewed by :



# Quality Control Report for Spike Analysis

## PAH's by HPLC

Matrix: Water

Lab Sample ID: 98080213-1

QC Batch ID: 9809PAH008

Spike Units: ug/l

Analysis Date: 09/03/1998

Preparation Date: 09/02/1998

Method: EPA 8310

Analyst: DC

Analyte	Spike Amount	Sample Result	Spike Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Acenaphthene	5.0	0.0	5.2	104	45	133
Acenaphthylene	5.0	0.0	4.3	86	45	133
Anthracene	5.0	0.0	5.4	108	45	133
Benzo(a)anthracene	5.0	0.0	5.5	110	45	133
Benzo(a)pyrene	5.0	0.0	5.9	118	45	133
Benzo(b)fluoranthene	5.0	0.0	5.6	112	45	133
Benzo(ghi)perylene	5.0	0.0	5.6	112	45	133
Benzo(k)fluoranthene	5.0	0.0	4.5	90	45	133
Chrysene	5.0	0.0	5.2	104	45	133
dibenzo(ah)anthracene	5.0	0.0	4.7	94	45	160
Fluoranthene	5.0	0.0	5.3	106	45	133
Fluorene	5.0	0.0	5.1	102	45	133
Indeno(123cd)pyrene	5.0	0.0	5.2	104	45	133
Naphthalene	5.0	0.0	4.4	88	45	133
Phenanthrene	5.0	0.0	5.2	104	45	133
Pyrene	5.0	0.0	5.5	110	45	133

# Quality Control Report for LCS Analysis

## PAH's by HPLC

Matrix: Water

Analysis Date: 09/03/1998

Lab Sample ID: LCS

Preparation Date: 09/02/1998

QC Batch ID: 9809PAH008

Method: EPA 8310

LCS Units: ug/l

Analyst: DC

Analyte	LCS Conc	LCS Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Acenaphthene	5.0	5.4	108	60	120
Acenaphthylene	5.0	4.6	92	60	120
Anthracene	5.0	5.3	106	60	120
Benzo(a)anthracene	5.0	5.5	110	60	120
Benzo(a)pyrene	5.0	5.9	118	60	120
Benzo(b)fluoranthene	5.0	5.5	110	60	120
Benzo(ghi)perylene	5.0	5.6	112	60	120
Benzo(k)fluoranthene	5.0	4.5	90	60	120
Chrysene	5.0	5.1	102	60	120
dibenzo(ah)anthracene	5.0	4.7	94	60	120
Fluoranthene	5.0	5.3	106	60	120
Fluorene	5.0	5.2	104	60	120
Indeno(123cd)pyrene	5.0	5.4	108	60	120
Naphthalene	5.0	4.6	92	60	120
Phenanthrene	5.0	5.2	104	60	120
Pyrene	5.0	5.5	110	60	120



# Quality Control Report for Method Blank

## PAH's by HPLC

Matrix: Water

Lab Sample ID: RB-09-02

QC Batch ID: 9809PAH008

Result Units: ug/l

Analysis Date: 09/04/1998

Preparation Date: 09/02/1998

Method: EPA 8310

Analyst: DC

Analyte	Result	Flag	Analyte	Result	Flag
Acenaphthene	5	U	Acenaphthylene	5	U
Anthracene	5	U	Benzo(a)anthracene	5.0	U
Benzo(a)pyrene	5.00	U	Benzo(b)fluoranthene	5.0	U
Benzo(ghi)perylene	5.0	U	Benzo(k)fluoranthene	5.00	U
Chrysene	5.00	U	dibenzo(ah)anthracene	5.0	U
Fluoranthene	5.00	U	Fluorene	5.00	U
Indeno(123cd)pyrene	5.00	U	Naphthalene	5.00	U
1-Methyl naphthalene	5.00	U	2-Methyl naphthalene	5.00	U
Phenanthrene	5.000	U	Pyrene	5.000	U

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Petroleum Hydrocarbons

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER: 7586  
DATE RECEIVED: 09/01/1998  
ANALYTICAL PROTOCOL: FL-PRO

Lab Reference Number	98090003-1	98090003-2	98090003-3	98090003-4	98090003-5
Client Sample ID	A9OZ-GW-MW07	A9OZ-GW-MW06	A9OZ-GW-MW03	A9OZ-GW-MW05	A9OZ-GW-MW04
Date Sampled	08/28/1998	08/29/1998	08/29/1998	08/29/1998	08/29/1998
Date Extracted	09/02/1998	09/02/1998	09/02/1998	09/02/1998	09/02/1998
Date Analyzed	09/02/1998	09/02/1998	09/02/1998	09/02/1998	09/02/1998
Sample Matrix (as Received)	Water	Water	Water	Water	Water
Analysis Confirmed	No	No	No	No	No
Dilution Factor	1	1	1	1	1
Result Units	mg/l	mg/l	mg/l	mg/l	mg/l
Total PHS	0.1 U	1.8	1.0	1.1	2.8
(Surr) C-39 (%)	91	66	69	78	128

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by :



PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Petroleum Hydrocarbons

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER: 7586  
DATE RECEIVED: 09/01/1998  
ANALYTICAL PROTOCOL: FL-PRO

Lab Reference Number	98090003-6	98090003-7	98090003-8	98090003-9	98090003-10
Client Sample ID	A9OZ-GW-MW02	A9OZ-GW-MWD08	A9OZ-GW-MW01	A9OZ-GW-DUP	A9OZ-GW-EQ
Date Sampled	08/29/1998	08/30/1998	08/30/1998	08/30/1998	08/30/1998
Date Extracted	09/02/1998	09/02/1998	09/02/1998	09/02/1998	09/02/1998
Date Analyzed	09/02/1998	09/02/1998	09/02/1998	09/02/1998	09/02/1998
Sample Matrix (as Received)	Water	Water	Water	Water	Water
Analysis Confirmed	No	No	No	No	No
Dilution Factor	2	1	10	5	1
Result Units	mg/l	mg/l	mg/l	mg/l	mg/l
Total PHS	5.9	0.5	14.8	10.0	0.1 U
(Surr) C-39 (%)	55	59	0 DL	0 DL	104

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by :



# Quality Control Report for LCS/LCS Duplicate Analysis

## Petroleum Hydrocarbons

Matrix: Water

Lab Sample ID: LCS

QC Batch ID: 9809FLRO011

LCS Units: mg/l

Analysis Date: 09/02/1998

Preparation Date: 09/02/1998

Method: FL-PRO

Analyst: ELA

Analyte	LCS		LCS		LCSD		RPD
	Conc		Result	Percent Recovery	Result	Percent Recovery	
(Surr) C-39	100.0	0.0	88.0	88	87.0	87	1
Total PHS	5.0	0.0	3.6	72	4.0	80	11

Analyte	Quality Control Limits		RPD
	Lower Limit	Upper Limit	
SS_C-39	4	140	31
Total PHS	57	110	11

# Quality Control Report for Method Blank

## Petroleum Hydrocarbons

Matrix: Water

Lab Sample ID: RB-09-02-98

QC Batch ID: 9809FLRO011

Result Units: mg/l

Analysis Date: 09/02/1998

Preparation Date: 09/02/1998

Method: FL-PRO

Analyst: ELA

Analyte	Result	Flag	Analyte	Result	Flag
Total PHS	0.1	U	(Surr) C-39 (%)	78.0	

# Quality Control Report for Spike/Spike Duplicate Analysis

## Petroleum Hydrocarbons

Matrix: Water

Analysis Date: 09/02/1998

Lab Sample ID: 9808227-2

Preparation Date: 09/02/1998

QC Batch ID: 9809FLRO011

Method: FL-PRO

Spike Units: mg/l

Analyst: ELA

Analyte	Spike Amount	Sample Result	Spike Result	Spike Percent Recovery	MSD Result	MSD Percent Recovery	RPD
(Surr) C-39	100.0	0.0	69.0	69	70.0	70	1
Total PHS	5.0	0.0	4.2	84	4.3	86	2

Quality Control Limits			
Analyte	Lower Limit	Upper Limit	RPD
SS_C-39	7	139	30
Total PHS	57	110	11

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194

Report of Analysis

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER: 7586  
DATE RECEIVED: 09/01/1998

Lab Reference Number  
Client Sample ID

98090003-1	98090003-2	98090003-3	98090003-4	98090003-5
A9OZ-GW-MW07	A9OZ-GW-MW06	A9OZ-GW-MW03	A9OZ-GW-MW05	A9OZ-GW-MW04

Date Sampled			08/28/1998	08/29/1998	08/29/1998	08/29/1998	08/29/1998
Sample Matrix (as Received)			Water	Water	Water	Water	Water
EPA 353.3	Nitrate	mg/l	NR	0.60	0.05 U	1.10	NR
EPA 354.1	Nitrite	mg/l	NR	0.02 U	0.02 U	0.02 U	NR
EPA 375.4	Sulfate	mg/l	NR	25	14	16	NR
EPA 6010	Lead, Total	ug/l	4	8	5	11	3 U

NR = Analysis not Requested.

U = Undetected. The value preceeding the 'U' is the MDL for the analyte. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRs Certification # E83239/83353

Reviewed by: 

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194

Report of Analysis

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West  
PROJECT NUMBER: 7586  
DATE RECEIVED: 09/01/1998

Lab Reference Number	98090003-6	98090003-7	98090003-8	98090003-9	98090003-10		
Client Sample ID	A9OZ-GW-MW02	A9OZ-GW-MWD08	A9OZ-GW-MW01	A9OZ-GW-DUP	A9OZ-GW-EQ		
Date Sampled	08/29/1998	08/30/1998	08/30/1998	08/30/1998	08/30/1998		
Sample Matrix (as Received)	Water	Water	Water	Water	Water		
EPA 6010	Lead, Total	ug/l	3 U	4	26	25	3 U

U = Undetected. The value preceeding the 'U' is the MDL for the analyte. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E63239/63353

Reviewed by : 





Brown &amp; Root Environmental

REPORT TO ADDRESS: TERRA TECHTALLAHASSEE FLTELEPHONE: 850-656-7157 FAX: 850-656-7403SITE MANAGER: PAUL YLGRNPROJECT NAME: NAS KEY WESTBRE PROJECT NO.: 7586 CODE: \_\_\_\_\_

P.O. NO.: \_\_\_\_\_

SHIPPED TO:

PAGE 1 OF 1PC&B, OVIEDO  
(LABORATORY NAME, CITY)

## CHAIN OF CUSTODY RECORD

SAMPLED BY (PRINT): PAUL HALVERSONSAMPLER SIGNATURE: [Signature]SAMPLE  
TYPE

MATRIX

COMP.

GRAB

PRES.  
TYPE

PARAMETERS

FLA PRO

HCL

0

HCL

HCL

0

LEAD

HCL

HCL

0

MERCURY

HCL

HCL

0

MERCURY

HCL

HCL

0

MERCURY

HCL

HCL

0

NUMBER OF  
CONTAINERS☒ STANDARD TAT ☐ RUSH☐ 24 HR. ☐ 48 HR. ☐ 72 HR. ☐ 7 DAYS

RESULTS DUE DATE: \_\_\_\_\_

COMMENTS:

LAB NO.	DATE	TIME	SAMPLE IDENTIFICATION	COMP.	GRAB	MATRIX
	8/28/98	1700	A902-GW-MW07		✓	GW
	8/28/98	1045	A902-GW-MW06		✓	GW
	8/29/98	1230	A902-GW-MW03		✓	GW
	8/29/98	1530	A902-GW-MW05		✓	GW
	8/29/98	1625	A902-GW-MW04		✓	GW
	8/29/98	1725	A902-GW-MW02		✓	GW
	8/29/98	1170	A902-GW-MW08		✓	GW
	8/29/98	1230	A902-GW-MW01		✓	GW
	8/29/98	—	A902-GW-DUP		✓	GW
	8/29/98	1220	A902-GW-EP		✓	GW
	8/29/98	—	A902-T.B.		—	T.B.

TOTAL NUMBER OF CONTAINERS

10 6 20 20 10 10 3 3 1 83

EMPTY BOTTLES RELINQUISHED BY (SIGNATURE)

①

SEAL INTACT?

YES NO N/A

DATE:

TIME:

EMPTY BOTTLES RECEIVED BY (SIGNATURE)

②

SEAL INTACT?

YES NO N/A

DATE:

TIME:

RELINQUISHED BY (SIGNATURE)

③

SEAL INTACT?

YES NO N/A

DATE:

TIME:

RECEIVED BY (SIGNATURE)

④

SEAL INTACT?

YES NO N/A

DATE:

TIME:

RELINQUISHED BY (SIGNATURE)

⑤

SEAL INTACT?

YES NO N/A

DATE:

TIME:

RECEIVED BY (SIGNATURE)

⑥

SEAL INTACT?

YES NO N/A

DATE:

TIME:

SPECIAL INSTRUCTIONS:

LABORATORY REMARKS:

SAMPLE CONTAINERS PRECLEANED BY:

☐ BRE ☐ LABORATORY ☐ MANUFACTURERMETHOD OF SHIPMENT: FED EXBILL OF LADING NO.: 805893140959WHITE-FULLY EXECUTED COPY  
YELLOW-RECEIVING LABORATORY COPY  
PINK-SAMPLERS' COPY/OA COPY  
GOLDENROD-SITE MANAGERS' COPY

SAMPLING TEAM:

P. HALVERSON  
P. CALLIGANRECEIVED FOR LABORATORY  
BY (SIGNATURE):

DATE:

TIME:

IN No. 3145

**APPENDIX I**

**GROUNDWATER SAMPLE LOG SHEETS**



## GROUNDWATER SAMPLE LOG SHEET

Page 1 of 1Project Site Name: NAS KEYProject No.: 7586

- ☐ Domestic Well Data  
☐ Monitoring Well Data  
☐ Other Well Type: \_\_\_\_\_  
☐ QA Sample Type: \_\_\_\_\_

Sample ID No.: A902-GW-OTAPC <sup>MWOL</sup>Sample Location: Boca ChicaSampled By: D. HALVERSONC.O.C. No.: 3145

Type of Sample:

- ☒ Low Concentration  
☐ High Concentration

## SAMPLING DATA:

Date: <u>8/30/98</u>	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: <u>1238</u>	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method: <u>PERIS. Pump.</u>								

## PURGE DATA:

Date: <u>8/30/98</u>	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: <u>PERIS. Pump.</u>	Initial	<u>5.96</u>	<u>1.03</u>	<u>30.7</u>	<u>14</u>	<u>1.10</u>	<u>.04</u>	
Monitor Reading (ppm): <u>0</u>	1	<u>6.00</u>	<u>1.03</u>	<u>30.8</u>	<u>-10</u>	<u>1.14</u>	<u>.04</u>	
Well Casing Diameter & Material	2	<u>5.98</u>	<u>1.03</u>	<u>36.4</u>	<u>-10</u>	<u>1.10</u>	<u>.04</u>	
Type: <u>PVC 2"</u>	3	<u>5.98</u>	<u>1.03</u>	<u>30.4</u>	<u>-10</u>	<u>1.12</u>	<u>.04</u>	
Total Well Depth (TD): <u>12.08</u>								
Static Water Level (WL): <u>2.63</u>								
One Casing Volume(gal/L): <u>1.5</u>								
Start Purge (hrs): <u>1140</u>								
End Purge (hrs): <u>1230</u>								
Total Purge Time (min): <u>50</u>								
Total Vol. Purged (gal/L): <u>5.0</u>								

## SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
<u>FL PRO</u>	<u>HCl</u>	<u>1 liter Amber Glass</u>	<u>1</u>
<u>504.1</u>	<u>HCl</u>	<u>40ml clear Glass</u>	<u>2</u>
<u>8010/8020-8021</u>	<u>HCl</u>	<u>40ml clear glass</u>	<u>2</u>
<u>8310</u>	<u>None</u>	<u>1 liter Amber Glass</u>	<u>1</u>
<u>Lead</u>	<u>HNO3</u>	<u>125 ml HBP</u>	<u>1</u>

## OBSERVATIONS / NOTES:

\* VOC<sup>s</sup> - GRAVITY FEED.

Circle if Applicable:


MS/MSD

Duplicate ID No.:

A902-GW-DUP

Signature(s):

[Signature]

Signature(s): 



## GROUNDWATER SAMPLE LOG SHEET

Page 1 of 1Project Site Name: NAS KEY WESTProject No.: 7580Sample ID No.: A902-GW-MWD3Sample Location: BOCA CHICASampled By: P.A.C.O.C. No.: 3145

Type of Sample:

☒ Low Concentration☐ High Concentration

- ☐ Domestic Well Data  
☒ Monitoring Well Data  
☐ Other Well Type:  
☐ QA Sample Type:

## SAMPLING DATA:

Date: <u>8/29/98</u>	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: <u>11:00</u>	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method: <u>PERISTALTIC PUMP</u>								

## PURGE DATA:

Date: <u>8/29/98</u>	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: <u>PERISTALTIC PUMP</u>	Initial	<u>5.78</u>	<u>-695</u>	<u>33.4</u>	<u>88</u>	<u>1.54</u>	<u>.03</u>	
Monitor Reading (ppm):	1	<u>5.78</u>	<u>1687</u>	<u>33.5</u>	<u>-11</u>	<u>1.62</u>	<u>.02</u>	
Well Casing Diameter & Material	2	<u>5.79</u>	<u>1689</u>	<u>33.6</u>	<u>-9</u>	<u>1.63</u>	<u>.02</u>	
Type: <u>PVC 2"</u>	3	<u>5.79</u>	<u>1689</u>	<u>33.5</u>	<u>-10</u>	<u>1.68</u>	<u>.02</u>	
Total Well Depth (TD): <u>12'00</u>								
Static Water Level (WL): <u>2.14</u>								
One Casing Volume(gal/L):								
Start Purge (hrs): <u>1041</u>								
End Purge (hrs): <u>1231</u>								
Total Purge Time (min): <u>50</u>								
Total Vol. Purged (gal/L): <u>5.0</u>								

## SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
<u>FL PRO</u>	<u>HCl</u>	<u>1 liter Amber Glass</u>	<u>1</u>
<u>584.1</u>	<u>HCl</u>	<u>40 ml clear Glass</u>	<u>2</u>
<u>8021</u>	<u>HCl</u>	<u>40 ml clear Glass</u>	<u>2</u>
<u>8310</u>	<u>None</u>	<u>1 liter Amber Glass</u>	<u>1</u>
<u>Lead</u>	<u>HNO<sub>3</sub></u>	<u>125 ml HDP</u>	<u>1</u>

## OBSERVATIONS / NOTES:

\*VOC - GRAVITY FEED


Circle if Applicable:


MS/MSD

Duplicate ID No.:

Signature(s):

Paul B. [Signature]

Signature(s): 

Signature(s): 

Signature(s): 







# Petroleum or Petroleum Products Water Sampling Log

A902

FDEP FACILITY NO.:	WELL NO.:	SAMPLE ID: MW01	DATE: 12/02/98
SITE NAME: A902 TRUCK FILL STAND		SITE LOCATION: NAS KEY WEST BORA COLCA	

## PURGE DATA

WELL DIAMETER (in): 2	TOTAL WELL DEPTH (ft): 11.90	DEPTH TO WATER (ft): 3.41	WELL CAPACITY (gal/ft): 0.16					
1 WELL VOLUME (gal) = (TOTAL WELL DEPTH - DEPTH TO WATER) x WELL CAPACITY = ( 11.90 - 3.41 ) x 0.16 = 1.35								
PURGE METHOD: PERISTALTIC / QUIESCENT		PURGING INITIATED AT: 1520	PURGING ENDED AT: 1548					
PURGE RATE (gpm): 0.25		TOTAL VOLUME PURGED (gal):						
WELL VOLS. PURGED	CUMUL VOLUME PURGED (gal)	pH	TEMP. (°C)	COND. (µmhos)	COLOR	ODOR	APPEARANCE	OTHER
1	1.35	6.9	29.1	1245	clear	none	clear	
2	2.70	6.9	29.2	1237	"	"	"	
3	4.05	6.9	28.9	1194	"	"	"	
4	5.40	6.9	29.1	1687	"	"	"	
5	6.75	6.9	28.9	1110	"	"	"	

## SAMPLING DATA

SAMPLED BY / AFFILIATION: Ricko. / SKIPPY - TENVIS		SAMPLER(S) SIGNATURE(S): Ricko.				
SAMPLING METHOD(S): PERISTALTIC / BALLER		SAMPLING INITIATED AT: 1550	SAMPLING ENDED AT: 1554			
FIELD DECONTAMINATION: Y N		FIELD-FILTERED: Y N	DUPLICATE: Y N			
SAMPLE CONTAINER SPECIFICATIONS		SAMPLE PRESERVATION		INTENDED ANALYSIS AND/OR METHOD		
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED		TOTAL VOLUME ADDED IN FIELD (ml)	FINAL pH
2	CG	40ml	HCl	Pre-Preserved	N/A	8021B
1	AG	100ml	None	"	"	8310
1	HDP	125ml	HNO3	"	"	239.2
2	CG	40ml	HCl	"	"	504
1	AG	100ml	HCl	"	"	FL-PRO

## REMARKS:

MATERIAL CODES: AG - AMBER GLASS; CG - CLEAR GLASS; HDP - HIGH DENSITY POLYETHYLENE; O - OTHER (SPECIFY)  
WELL CAPACITY: 1.25" = 0.06 gal/ft; 2" = 0.16 gal/ft; 4" = 0.65 gal/ft; 6" = 1.47 gal/ft; 8" = 2.61 gal/ft; 12" = 5.88 gal/ft

NOTE: this does not constitute all the information required by Chapter 62-168, F.A.C.

# Petroleum or Petroleum Products Water Sampling Log

A902-

FDEP FACILITY NO.:	WELL NO.:	SAMPLE ID: MW02	DATE: 12/2/98
SITE NAME: A902 TRUCK FILL STAND		SITE LOCATION: NAS KEY WEST BOCA CHICA	

## PURGE DATA

WELL DIAMETER (in): 2	TOTAL WELL DEPTH (ft): 11.95	DEPTH TO WATER (ft): 2.02	WELL CAPACITY (gal/ft): 0.16
-----------------------	------------------------------	---------------------------	------------------------------

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH - DEPTH TO WATER) x WELL CAPACITY =

$$= (11.95 - 2.02) \times 0.16 = 1.59$$

PURGE METHOD: PERISTALTIC/QUIESCENT					PURGING INITIATED AT: 1355		PURGING ENDED AT: 1430	
WELL VOLS. PURGED	CUMUL. VOLUME PURGED (gal)	pH	TEMP. (°C)	COND. (µmhos)	PURGE RATE (gpm): 0.25		TOTAL VOLUME PURGED (gal): 8	
					COLOR	ODOR	APPEARANCE	OTHER
1	1.59	6.9	27.2	1100	clear	none	clear	
2	3.18	6.9	27.3	1042	"	"	"	
3	4.77	6.8	27.5	988	"	"	"	
4	6.36	6.8	22.2	892	"	"	"	
5	7.95							

## SAMPLING DATA

SAMPLED BY / AFFILIATION: RICKO. / SKIPV. - TENVIS		SAMPLER(S) SIGNATURE(S): <i>Ricko</i>	
SAMPLING METHOD(S): PERISTALTIC / BAILED		SAMPLING INITIATED AT: 1631	
		SAMPLING ENDED AT: 1634	

FIELD DECONTAMINATION: (Y) N

FIELD-FILTERED: Y (N)

DUPLICATE: Y (N)

## SAMPLE CONTAINER SPECIFICATIONS

## SAMPLE PRESERVATION

## INTENDED ANALYSIS AND/OR METHOD

NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (ml)	FINAL pH	
2	CG	40ml	HCl	Pre-Preserved	N/A	8021 B
1	AG	1 Hr	none	N/A	N/A	8310
1	HDP	125ml	HNO <sub>3</sub>	Pre-Preserved	"	239.2
2	CG	40ml	HCl	"	"	504
1	AG	1 Hr	HCl	"	"	FL PRO

## REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; HDP = HIGH DENSITY POLYETHYLENE; O = OTHER (SPECIFY)

WELL CAPACITY: 1.25" = 0.06 gal/ft; 2" = 0.16 gal/ft; 4" = 0.65 gal/ft; 6" = 1.47 gal/ft; 8" = 2.61 gal/ft; 12" = 5.98 gal/ft

NOTE: this does not constitute all the information required by Chapter 62-168, F.A.C.



# Petroleum or Petroleum Products Water Sampling Log

A902-

FDEP FACILITY NO.:	WELL NO.:	SAMPLE ID: MW97	DATE: 12/2/98
SITE NAME: A902 TRUCK FILL STAND		SITE LOCATION: NAS KEY WEST BOCA CHICA	

## PURGE DATA

WELL DIAMETER (in): 2	TOTAL WELL DEPTH (ft): 11.95	DEPTH TO WATER (ft): 3.05	WELL CAPACITY (gal/ft): 0.16
-----------------------	------------------------------	---------------------------	------------------------------

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH - DEPTH TO WATER) x WELL CAPACITY =

$$= (11.95 - 3.05) \times 0.16 = 1.44$$

PURGE METHOD:					PURGING INITIATED AT: 1640		PURGING ENDED AT: 1715	
					PURGE RATE (gpm): 0.25		TOTAL VOLUME PURGED (gal): 7.1 gal	
WELL VOLS. PURGED	CUMUL. VOLUME PURGED (gal)	pH	TEMP. (°C)	COND. (µmhos)	COLOR	ODOR	APPEARANCE	OTHER
1	1.42	7.4	28.2	1550	clear	none	clear	
2	2.84	7.4	28.2	1560	"	"	"	
3	4.26	7.5	27.8	1562	"	"	"	
4	5.68	7.5	27.7	1570	"	"	"	
5	7.10	7.5	27.7	1565	"	"	"	

## SAMPLING DATA

SAMPLED BY/ AFFILIATION: RICK O. / SKIPPY - TENVIS	SAMPLER(S) SIGNATURE(S): Rick O. Skippy	
SAMPLING METHOD(S): PERISTALTIC / BA-111	SAMPLING INITIATED AT: 1716	SAMPLING ENDED AT: 1720

FIELD DECONTAMINATION: Y (N)			FIELD FILTERED: Y (N)			DUPLICATE: Y (N)	
SAMPLE CONTAINER SPECIFICATIONS			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (ml)	FINAL pH		
2	CG	40ml	HCl	Pre-Preserved	N/A	8021B	
1	AG	1 Ltr	none	"	"	8310	
1	PLASTIC	125ml	HNO3	"	"	239.2	
2	CG	40ml	HCl	"	"	504	
1	AG	1 Ltr	HCl	"	"	FL-Pro	

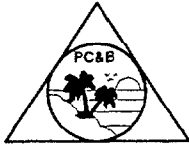
## REMARKS:

MATERIAL CODES: AG - AMBER GLASS; CG - CLEAR GLASS; HDP - HIGH DENSITY POLYETHYLENE; O - OTHER (SPECIFY)  
WELL CAPACITY: 1.25" = 0.06 gal/ft; 2" = 0.16 gal/ft; 4" = 0.65 gal/ft; 6" = 1.47 gal/ft; 8" = 2.61 gal/ft; 12" = 5.88 gal/ft

NOTE: this does not constitute all the information required by Chapter 62-160, F.A.C.

## **APPENDIX J**

### **ANALYTICAL REPORTS FOR SOIL PRE-DISPOSAL CHARACTERIZATION**



## PC&B Environmental Laboratories, Inc.

210 Park Road, Oviedo, Florida 32765  
Phone: 407-359-7194 Fax: 407-359-7197

09-16-1998

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-


Dear Paul Calligan:

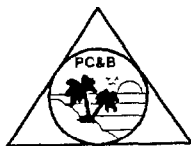
Enclosed are the results of the analysis of your samples received 08/28/1998.

Our laboratory is certified by the Florida DHRS (Lab #E83239) and operates under an FDEP approved Comprehensive Quality Assurance Plan (#900134G). Unless otherwise noted, all results are reported as received. All data were determined in accordance with published procedures (EPA-600/4-79-020), Methods for Chemical Analysis of Water and Wastes, Revised March 1983 and/or Standard Methods for the examination of Water and Wastewater, 18th Edition 1989 and/or Test Methods for Evaluating Solid Waste (EPA-SW-846, Revised January 1995), unless stated otherwise in our CompQapp under method modifications.

If you have any questions, please do not hesitate to give me a call.

Sincerely,

  
\_\_\_\_\_  
Andrew Harrison  
Laboratory Manager



## PC&B Environmental Laboratories, Inc.

210 Park Road, Oviedo, Florida 32765  
Phone: 407-359-7194 Fax: 407-359-7197

Client : Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

Contact : Paul Calligan  
Phone : (850) 656-5458

Laboratory Reference Number : 98080207

Project Name : NAS Key West Truck Fill Stand  
Project Number : 7586  
Sample temperature at time of receipt: 4 degrees C

Chain of Custody : 3146

Laboratory ID	Matrix	Client ID	Status	Date/Time Sampled
98080207-1	Soil	A902-PREBURN	RUN	08/27/1998 16:00

Number	Parameter	Description
1	Group Test	RCRA Metals by ICAP in Soil
1	FL-PRO	Petroleum Hydrocarbons
1	EPA 8100	Polynuclear Aromatic Hydrocarbons
1	EPA 8021	Volatile Organics
1	EPA 5050/9252	Total Halogens

## Case Narrative

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

CASE NARRATIVE for Work Order: 98080207  
Project Number: 7586  
Project Name: NAS Key West Truck Fill Stand

This Case Narrative is a summary of events and/or problems encountered with this Work Order.

For sample requesting EPA 8021 analysis, The GCMS method EPA 8260 was substituted in order to generate the highest quality data at no additional cost.

Analysis of EPA 8100 was performed in place of EPA 8310 due to soil matrix.

### Definition of Flags

DL	=	No surrogate result due to dilution or matrix interference.
J	=	Estimated Value, value not accurate.
L	=	Off-scale high. Actual value is greater than value given.
T	=	Value reported is less than the laboratory method detection limit.
V	=	Analyte was detected in the blank and sample.



## QC Batch Summary

Paul Calligan  
Tetra Tech NUS, Inc.  
1311 Executive Center Drive, Ste. 220  
Tallahassee, FL 32301-

QC BATCH SUMMARY for Work Order: 98080207  
Project Number: 7586  
Project Name: NAS Key West Truck Fill Stand

Method	SubNum	QC Batch
EPA 6010 - Arsenic by ICAP	-1	9808RC111
EPA 6010 - Barium by ICAP	-1	9808RC111
EPA 6010 - Cadmium by ICAP	-1	9808RC111
EPA 6010 - Chromium by ICAP	-1	9808RC111
EPA 6010 - Lead by ICAP	-1	9808RC111
EPA 7471 - Mercury (Total) by Cold Vapor AA	-1	9808HG094
FL-PRO - Petroleum Hydrocarbons	-1	9809FLRO005
EPA 8100 - Polynuclear Aromatic Hydrocarbons	-1	9809PAH006
EPA 6010 - Selenium by ICAP	-1	9808RC111
EPA 6010 - Silver by ICAP	-1	9808RC111
EPA 5050/9252 - Total Halogens	-1	9808TX103
EPA 8021 - Volatile Organics	-1	9809MS1007

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 08/28/1998  
ANALYTICAL PROTOCOL: EPA 5035/8021

Lab Reference Number : 98080207-1  
Client Sample ID : A902-PREBURN  
Date Sampled : 08/27/1998  
Date Extracted : 08/28/1998  
Date Analyzed : 09/03/1998  
Percent Moisture : 19.4  
Sample Matrix (as Received): Soil  
Analysis Confirmed : GCMS  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
5	Benzene	6 U	ug/kg	NM
5	Bromobenzene	6 U	ug/kg	NM
5	Bromochloromethane	6 U	ug/kg	NM
5	Bromodichloromethane	6 U	ug/kg	NM
5	Bromoform	6 U	ug/kg	NM
5	Bromomethane	6 U	ug/kg	NM
5	n-Butylbenzene	6 U	ug/kg	NM
5	sec-Butylbenzene	6 U	ug/kg	NM
5	tert-Butylbenzene	6 U	ug/kg	NM
5	Carbon tetrachloride	6 U	ug/kg	NM
5	Chlorobenzene	6 U	ug/kg	NM
5	Chloroethane	6 U	ug/kg	NM
5	Chloroform	6 U	ug/kg	NM
5	Chloromethane	6 U	ug/kg	NM
5	2-Chlorotoluene	6 U	ug/kg	NM
5	4-Chlorotoluene	6 U	ug/kg	NM
5	Dibromochloromethane	6 U	ug/kg	NM
5	1,2-Dibromoethane	6 U	ug/kg	NM
5	Dibromomethane	6 U	ug/kg	NM
5	1,2-Dichlorobenzene	6 U	ug/kg	NM
5	1,3-Dichlorobenzene	6 U	ug/kg	NM
5	1,4-Dichlorobenzene	6 U	ug/kg	NM
5	Dichlorodifluoromethane	6 U	ug/kg	NM
5	1,1-Dichloroethane	6 U	ug/kg	NM
5	1,2-Dichloroethane	6 U	ug/kg	NM
5	1,1-Dichloroethene	6 U	ug/kg	NM
5	cis-1,2-Dichloroethene	6 U	ug/kg	NM
5	trans-1,2-Dichloroethene	6 U	ug/kg	NM
5	1,2-Dichloropropane	6 U	ug/kg	NM
5	1,3-Dichloropropane	6 U	ug/kg	NM
5	2,2-Dichloropropane	6 U	ug/kg	NM
5	1,1-Dichloropropene	6 U	ug/kg	NM
5	Ethylbenzene	6 U	ug/kg	NM
5	Hexachlorobutadiene	6 U	ug/kg	NM
5	Isopropylbenzene	6 U	ug/kg	NM
5	p-Isopropyltoluene	6 U	ug/kg	NM
5	Methylene chloride	29 V	ug/kg	NM
5	Naphthalene	6 U	ug/kg	NM
5	n-Propylbenzene	6 U	ug/kg	NM
5	Styrene	6 U	ug/kg	NM
5	1,1,1,2-Tetrachloroethane	6 U	ug/kg	NM
5	1,1,2,2-Tetrachloroethane	6 U	ug/kg	NM
5	Tetrachloroethene	6 U	ug/kg	NM
5	Toluene	6 U	ug/kg	NM
5	1,2,3-Trichlorobenzene	6 U	ug/kg	NM
5	1,2,4-Trichlorobenzene	6 U	ug/kg	NM
5	1,1,1-Trichloroethane	6 U	ug/kg	NM
5	1,1,2-Trichloroethane	6 U	ug/kg	NM
5	Trichloroethene	6 U	ug/kg	NM
5	Trichlorofluoromethane	6 U	ug/kg	NM
5	1,2,3-Trichloropropane	6 U	ug/kg	NM
5	1,2,4-Trimethylbenzene	14	ug/kg	NM
5	1,3,5-Trimethylbenzene	6 U	ug/kg	NM

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Volatile Organics

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 08/28/1998  
ANALYTICAL PROTOCOL: EPA 5035/8021

Lab Reference Number : 98080207-1  
Client Sample ID : A902-PREBURN  
Date Sampled : 08/27/1998  
Date Extracted : 08/28/1998  
Date Analyzed : 09/03/1998  
Percent Moisture : 19.4  
Sample Matrix (as Received): Soil  
Analysis Confirmed : GCMS  
Dilution Factor : 1

	MDL	Analyte		Results/Flag	Units	Analyst
5		Vinyl chloride	6 U	ug/kg	NM	
5		m&p-Xylenes	6 U	ug/kg	NM	
5		o-Xylene	6 U	ug/kg	NM	
5		MTBE	6 U	ug/kg	NM	
		(Surr) 1,2-Dichloroethane-d4 (%)	94	%	NM	
		(Surr) Toluene-d8 (%)	100	%	NM	
		(Surr) 4-Bromofluorobenzene (%)	128	%	NM	

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Dry Weight basis.

FDEP CompQAPP # 900134G - FHRs Certification # E83239/83353

Reviewed by : 

# Quality Control Report for Method Blank

## Volatile Organics

Matrix: Soil

Lab Sample ID: RB-09-03-98

QC Batch ID: 9809MS1007

Result Units: ug/kg

Analysis Date: 09/03/1998

Preparation Date: 09/03/1998

Method: EPA 8021

Analyst: NM

Analyte	Result	Flag	Analyte	Result	Flag
Benzene	5	U	Bromobenzene	5	U
Bromochloromethane	5	U	Bromodichloromethane	5	U
Bromoform	5	U	Bromomethane	5	U
n-Butylbenzene	5	U	sec-Butylbenzene	5	U
tert-Butylbenzene	5	U	Carbon tetrachloride	5	U
Chlorobenzene	5	U	Chloroethane	5	U
Chloroform	5	U	Chloromethane	5	U
2-Chlorotoluene	5	U	4-Chlorotoluene	5	U
Dibromochloromethane	5	U	1,2-Dibromoethane	5	U
Dibromomethane	5	U	1,2-Dichlorobenzene	5	U
1,3-Dichlorobenzene	5	U	1,4-Dichlorobenzene	5	U
Dichlorodifluoromethane	5	U	1,1-Dichloroethane	5	U
1,2-Dichloroethane	5	U	1,1-Dichloroethene	5	U
cis-1,2-Dichloroethene	5	U	trans-1,2-Dichloroethene	5	U
1,2-Dichloropropane	5	U	1,3-Dichloropropane	5	U
2,2-Dichloropropane	5	U	1,1-Dichloropropene	5	U
Ethylbenzene	5	U	Hexachlorobutadiene	5	U
Isopropylbenzene	5	U	p-Isopropyltoluene	5	U
Methylene chloride	15		Naphthalene	5	U
n-Propylbenzene	5	U	Styrene	5	U
1,1,1,2-Tetrachloroethane	5	U	1,1,2,2-Tetrachloroethane	5	U
Tetrachloroethene	5	U	Toluene	5	U
1,2,3-Trichlorobenzene	5	U	1,2,4-Trichlorobenzene	5	U
1,1,1-Trichloroethane	5	U	1,1,2-Trichloroethane	5	U
Trichloroethene	5	U	Trichlorofluoromethane	5	U
1,2,3-Trichloropropane	5	U	1,2,4-Trimethylbenzene	5	U
1,3,5-Trimethylbenzene	5	U	Vinyl chloride	5	U
m&p-Xylenes	5	U	o-Xylene	5	U
(Surr) 1,2-Dichloroethane-d4 (%)	111		(Surr) Toluene-d8 (%)	104	
(Surr) 4-Bromofluorobenzene (%)	118		MTBE	5	U

# Quality Control Report for LCS Analysis

## Volatile Organics

Matrix: Soil

Lab Sample ID: LCS

QC Batch ID: 9809MS1007

LCS Units: ug/kg

Analysis Date: 09/03/1998

Preparation Date: 09/03/1998

Method: EPA 8021

Analyst: NM

Analyte	LCS Conc	LCS Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Benzene	20	21	105	69	139
Carbon tetrachloride	20	18	90	64	134
Chlorobenzene	20	20	100	77	127
1,4-Dichlorobenzene	20	24	120	80	125
1,1-Dichloroethene	20	22	110	64	137
Ethylbenzene	20	19	95	66	128
Toluene	20	17	85	65	135
Trichloroethene	20	19	95	69	136

# Quality Control Report for Spike/Spike Duplicate Analysis

## Volatile Organics

Matrix: Soil

Lab Sample ID: 9809007-3

QC Batch ID: 9809MS1007

Spike Units: ug/kg

Analysis Date: 09/03/1998

Preparation Date: 09/03/1998

Method: EPA 8021

Analyst: NM

Analyte	Spike Amount	Sample Result	Spike Result	Spike Percent Recovery	MSD Result	MSD Percent Recovery	RPD
Benzene	50	0	49	98	53	106	8
Carbon tetrachloride	50	0	57	114	51	102	11
Chlorobenzene	50	0	48	96	51	102	6
1,4-Dichlorobenzene	50	0	54	108	60	120	11
1,1-Dichloroethene	50	0	52	104	52	104	0
Ethylbenzene	50	0	49	98	49	98	0
Toluene	50	0	42	84	45	90	7
Trichloroethene	50	0	53	106	52	104	2

### Quality Control Limits

Analyte	Lower Limit	Upper Limit	RPD
Benzene	59	144	18
Carbon tetrachloride	49	148	15
Chlorobenzene	67	130	18
1,4-Dichlorobenzene	56	141	18
1,1-Dichloroethene	52	143	18
Ethylbenzene	42	157	19
Toluene	54	136	19
Trichloroethene	59	144	18

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Polynuclear Aromatic Hydrocarb

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 08/28/1998  
ANALYTICAL PROTOCOL: EPA 8100

Lab Reference Number : 98080207-1  
Client Sample ID : A902-PREBURN  
Date Sampled : 08/27/1998  
Date Extracted : 09/01/1998  
Date Analyzed : 09/02/1998  
Percent Moisture : 19.4  
Sample Matrix (as Received): Soil  
Analysis Confirmed : No  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
100	Acenaphthene	125 U	ug/kg	ELA
100	Acenaphthylene	125 U	ug/kg	ELA
100	Anthracene	125 U	ug/kg	ELA
100	Benzo(a)anthracene	125 U	ug/kg	ELA
100	Benzo(a)pyrene	125 U	ug/kg	ELA
100	Benzo(b)fluoranthene	125 U	ug/kg	ELA
100	Benzo(ghi)perylene	125 U	ug/kg	ELA
100	Benzo(k)fluoranthene	125 U	ug/kg	ELA
100	Chrysene	125 U	ug/kg	ELA
100	Dibenzo(ah)anthracene	125 U	ug/kg	ELA
100	Fluoranthene	125 U	ug/kg	ELA
100	Fluorene	125 U	ug/kg	ELA
100	Indeno(123-cd)pyrene	125 U	ug/kg	ELA
100	Naphthalene	125 U	ug/kg	ELA
100	1-Methyl naphthalene	125 U	ug/kg	ELA
100	2-Methyl naphthalene	125 U	ug/kg	ELA
100	Phenanthrene	125 U	ug/kg	ELA
100	Pyrene	125 U	ug/kg	ELA
	(Surr) 2-Fluorobiphenyl (%)	57	%	ELA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Dry Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

# Quality Control Report for Spike Analysis

## Polynuclear Aromatic Hydrocarbons

Matrix: Soil

Lab Sample ID: 9808142-3

QC Batch ID: 9809PAH006

Spike Units: ug/kg

Analysis Date: 09/02/1998

Preparation Date: 09/01/1998

Method: EPA 8100

Analyst: ELA

Analyte	Spike Amount	Sample Result	Spike Result	Percent Recovery	Lower Control Limit	Upper Control Limit
(Surr) 2-Fluorobiphenyl	100	0	80	80	45	101
Acenaphthene	50	0	54	108	46	125
Acenaphthylene	50	0	41	82	42	105
Anthracene	50	0	56	112	53	132
Benzo(a)anthracene	50	0	45	90	41	121
Benzo(a)pyrene	50	0	46	92	45	119
Benzo(b)fluoranthene	50	0	56	112	44	125
Benzo(ghi)perylene	50	0	44	88	37	120
Benzo(k)fluoranthene	50	0	45	90	44	126
Chrysene	50	0	45	90	48	117
Dibenzo(ah)anthracene	50	0	46	92	39	123
Fluoranthene	50	0	47	94	49	118
Fluorene	50	0	44	88	44	112
Indeno(123-cd)pyrene	50	0	46	92	36	124
Naphthalene	50	0	38	76	38	102
Phenanthrene	50	0	44	88	45	118
Pyrene	50	0	47	94	49	120



# Quality Control Report for Method Blank

## Polynuclear Aromatic Hydrocarbons

Matrix: Soil

Lab Sample ID: RB-09-01-98

QC Batch ID: 9809PAH006

Result Units: ug/kg

Analysis Date: 09/02/1998

Preparation Date: 09/01/1998

Method: EPA 8100

Analyst: ELA

Analyte	Result	Flag	Analyte	Result	Flag
Acenaphthene	100	U	Acenaphthylene	100	U
Anthracene	100	U	Benzo(a)anthracene	100	U
Benzo(a)pyrene	100	U	Benzo(b)fluoranthene	100	U
Benzo(ghi)perylene	100	U	Benzo(k)fluoranthene	100	U
Chrysene	100	U	Dibenzo(ah)anthracene	100	U
Fluoranthene	100	U	Fluorene	100	U
Indeno(123-cd)pyrene	100	U	Naphthalene	100	U
1-Methyl naphthalene	100	U	2-Methyl naphthalene	100	U
Phenanthrene	100	U	Pyrene	100	U
(Surr) 2-Fluorobiphenyl (%)	73				

# Quality Control Report for LCS/LCS Duplicate Analysis

## Polynuclear Aromatic Hydrocarbons

Matrix: Soil  
Lab Sample ID: LCS  
QC Batch ID: 9809PAH006  
LCS Units: ug/kg

Analysis Date: 09/02/1998  
Preparation Date: 09/01/1998  
Method: EPA 8100  
Analyst: ELA

Analyte	LCS Conc		LCS Result	LCS Percent Recovery	LCS Result	LCS Percent Recovery	RPD
(Surr) 2-Fluorobiphenyl	100	0	78	78	77	77	1
Acenaphthene	50	0	50	100	51	102	2
Acenaphthylene	50	0	39	78	38	76	3
Anthracene	50	0	52	104	52	104	0
Benzo(a)anthracene	50	0	40	80	41	82	2
Benzo(a)pyrene	50	0	43	86	43	86	0
Benzo(b)fluoranthene	50	0	52	104	50	100	4
Benzo(ghi)perylene	50	0	41	82	41	82	0
Benzo(k)fluoranthene	50	0	43	86	43	86	0
Chrysene	50	0	42	84	43	86	2
Dibenzo(ah)anthracene	50	0	43	86	44	88	2
Fluoranthene	50	0	44	88	44	88	0
Fluorene	50	0	41	82	41	82	0
Indeno(123-cd)pyrene	50	0	42	84	42	84	0
Naphthalene	50	0	36	72	35	70	3
Phenanthrene	50	0	42	84	42	84	0
Pyrene	50	0	44	88	45	90	2

### Quality Control Limits

Analyte	Lower Limit	Upper Limit	RPD
SS_2-Fluorobiphenyl	51	100	11
Acenaphthene	62	125	11
Acenaphthylene	55	100	9
Anthracene	64	128	11
Benzo(a)anthracene	54	110	11
Benzo(a)pyrene	56	114	11
Benzo(b)fluoranthene	53	119	13
Benzo(ghi)perylene	50	112	13
Benzo(k)fluoranthene	53	119	13
Chrysene	53	114	12
Dibenzo(ah)anthracene	51	116	13
Fluoranthene	58	110	10
Fluorene	54	107	11
Indeno(123-cd)pyrene	51	115	13
Naphthalene	53	94	9
Phenanthrene	53	112	12
Pyrene	60	111	10

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194  
FAX: 359-7197

Petroleum Hydrocarbons

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 08/28/1998  
ANALYTICAL PROTOCOL: FL-PRO

Lab Reference Number : 96080207-1  
Client Sample ID : A902-PREBURN  
Date Sampled : 08/27/1998  
Date Extracted : 09/01/1998  
Date Analyzed : 09/02/1998  
Percent Moisture : 19.4  
Sample Matrix (as Received): Soil  
Analysis Confirmed : No  
Dilution Factor : 1

MDL	Analyte	Results/Flag	Units	Analyst
4.0	Total PHS	16.1	mg/kg	ELA
	(Surr) C-39 (%)	80	%	ELA

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Dry Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

# Quality Control Report for Spike Analysis

## INORGANICS

Analyte		Spike Amount	Sample Result	Spike Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Method: FL-PRO SS_C-39	QC Batch: 9809FLRO005	Sample ID: 9808142-2 100.0 mg/kg	Date Prep: 09/01/1998 0.0	Date Anal: 09/02/1998 90.0	90	Analyst: ELA 5	141
Method: FL-PRO Total PHS	QC Batch: 9809FLRO005	Sample ID: 9808142-2 5.0 mg/kg	Date Prep: 09/01/1998 0.0	Date Anal: 09/02/1998 3.9	78	Analyst: ELA 54	111

# Quality Control Report for Method Blank

## INORGANICS

Analyte	Units	Result	Flag	QC Batch ID	Analyst
Method: FL-PRO Total PHS	QC Batch: 9809FLRO005 mg/kg	Sample ID: RB-09-01-98 4.0	Date Prep: 09/01/1998 U	Date Anal: 09/02/1998 9809FLRO005	Analyst: ELA ELA
Method: FL-PRO (Surr) C-39 (%)	QC Batch: 9809FLRO005 %	Sample ID: RB-09-01-98 78.0	Date Prep: 09/01/1998	Date Anal: 09/02/1998 9809FLRO005	Analyst: ELA ELA

# Quality Control Report for LCS/LCS Duplicate Analysis

## INORGANICS

Analyte		LCS Conc		LCS Result	Percent Recovery	LCSD Result	Percent Recovery	RPD
Method: FL-PRO SS_C-39	QC Batch: 9809FLRO005	Sample ID: LCS 100.0 mg/kg	Date Prep: 09/01/1998	Date Anal: 09/02/1998	Analyst: ELA			
				87.0	87	91.0	91	4
Method: FL-PRO Total PHS	QC Batch: 9809FLRO005	Sample ID: LCS 5.0 mg/kg	Date Prep: 09/01/1998	Date Anal: 09/02/1998	Analyst: ELA			
				4.2	84	4.1	82	2

### Quality Control Limits

Analyte	Lower Limit	Upper Limit	RPD
SS_C-39	0	145	33
Total PHS	55	110	11

PC&B Environmental Laboratories, Inc.  
210 Park Road  
Oviedo, FL 32765  
PHONE: 407-359-7194

Report of Analysis

CLIENT NAME: Tetra Tech NUS, Inc.  
PROJECT NAME: NAS Key West Truck Fill Stand  
PROJECT NUMBER: 7586  
DATE RECEIVED: 08/28/1998

Lab Reference Number : 98080207-1  
Client Sample ID : A902-PREBURN  
Date Sampled : 08/27/1998  
Percent Moisture : 19.4  
Sample Matrix (as Received): Soil

Method	Parameter	Results/Flag	Units	Analyst	Date Prep	Date Anal	MDL
EPA 6010	Arsenic, Total	1.6	mg/kg	GG	08/28/1998	08/31/1998	0.5
EPA 6010	Barium, Total	5.2	mg/kg	GG	08/28/1998	08/31/1998	2.0
EPA 6010	Cadmium, Total	0.1 U	mg/kg	GG	08/28/1998	08/31/1998	0.1
EPA 6010	Chromium, Total	3.0	mg/kg	GG	08/28/1998	08/31/1998	0.1
EPA 6010	Lead, Total	2.7	mg/kg	GG	08/28/1998	08/31/1998	0.3
EPA 7471	Mercury, Total	0.1 U	mg/kg	SH	08/28/1998	08/28/1998	0.1
EPA 6010	Selenium, Total	0.6 U	mg/kg	GG	08/28/1998	08/31/1998	0.5
EPA 6010	Silver, Total	0.6 U	mg/kg	GG	08/28/1998	08/31/1998	0.5
EPA 5050/9252	Total Halogens	620 U	mg/kg	SH	08/28/1998	08/28/1998	500

U = Undetected. The value preceeding the 'U' is the MDL for the analyte. Results reported on a Dry Weight basis (where applicable).

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : 

# Quality Control Report for Method Blank

## INORGANICS

Analyte	Units	Result	Flag	QC Batch ID	Analyst
Method: EPA 6010A Arsenic, Total	QC Batch: 9808RC111 mg/kg	Sample ID: RB-08-28-98 0.5	Date Prep: 08/28/1998 U	Date Anal: 08/31/1998 9808RC111	Analyst: GG GG
Method: EPA 6010A Barium, Total	QC Batch: 9808RC111 mg/kg	Sample ID: RB-08-28-98 2.0	Date Prep: 08/28/1998 U	Date Anal: 08/31/1998 9808RC111	Analyst: GG GG
Method: EPA 6010A Cadmium, Total	QC Batch: 9808RC111 mg/kg	Sample ID: RB-08-28-98 0.1	Date Prep: 08/28/1998 U	Date Anal: 08/31/1998 9808RC111	Analyst: GG GG
Method: EPA 6010A Chromium, Total	QC Batch: 9808RC111 mg/kg	Sample ID: RB-08-28-98 0.1	Date Prep: 08/28/1998 U	Date Anal: 08/31/1998 9808RC111	Analyst: GG GG
Method: EPA 6010A Lead, Total	QC Batch: 9808RC111 mg/kg	Sample ID: RB-08-28-98 0.3	Date Prep: 08/28/1998 U	Date Anal: 08/31/1998 9808RC111	Analyst: GG GG
Method: EPA 6010A Selenium, Total	QC Batch: 9808RC111 mg/kg	Sample ID: RB-08-28-98 0.5	Date Prep: 08/28/1998 U	Date Anal: 08/31/1998 9808RC111	Analyst: GG GG
Method: EPA 6010A Silver, Total	QC Batch: 9808RC111 mg/kg	Sample ID: RB-08-28-98 0.5	Date Prep: 08/28/1998 U	Date Anal: 08/31/1998 9808RC111	Analyst: GG GG
Method: EPA 7471 Mercury, Total	QC Batch: 9808HG094 mg/kg	Sample ID: RB-08-28-98 0.1	Date Prep: 08/28/1998 U	Date Anal: 08/28/1998 9808HG094	Analyst: SH SH



# Quality Control Report for Duplicate Analysis

## INORGANICS

Analyte		Sample Result	Dupe Result	RPD	Control Limit
Method: EPA 6010A	QC Batch: 9808RC111	Sample ID: 98080209-1	Date Prep: 08/28/1998	Date Anal: 08/31/1998	Analyst: GG
Arsenic, Total		mg/kg	1.5	1.3	14
Method: EPA 6010A	QC Batch: 9808RC111	Sample ID: 98080209-1	Date Prep: 08/28/1998	Date Anal: 08/31/1998	Analyst: GG
Barium, Total		mg/kg	30.0	29.0	3
Method: EPA 6010A	QC Batch: 9808RC111	Sample ID: 98080209-1	Date Prep: 08/28/1998	Date Anal: 08/31/1998	Analyst: GG
Cadmium, Total		mg/kg	0.2	0.2	0
Method: EPA 6010A	QC Batch: 9808RC111	Sample ID: 98080209-1	Date Prep: 08/28/1998	Date Anal: 08/31/1998	Analyst: GG
Chromium, Total		mg/kg	4.5	4.6	2
Method: EPA 6010A	QC Batch: 9808RC111	Sample ID: 98080209-1	Date Prep: 08/28/1998	Date Anal: 08/31/1998	Analyst: GG
Lead, Total		mg/kg	105.0	106.0	1
Method: EPA 6010A	QC Batch: 9808RC111	Sample ID: 98080209-1	Date Prep: 08/28/1998	Date Anal: 08/31/1998	Analyst: GG
Selenium, Total		mg/kg	0.0	0.0	0
Method: EPA 6010A	QC Batch: 9808RC111	Sample ID: 98080209-1	Date Prep: 08/28/1998	Date Anal: 08/31/1998	Analyst: GG
Silver, Total		mg/kg	0.0	0.0	0
Method: EPA 7471	QC Batch: 9808HG094	Sample ID: 98080192-1	Date Prep: 08/28/1998	Date Anal: 08/28/1998	Analyst: SH
Mercury, Total		mg/kg	0.00	0.00	0
Method: EPA 5050/9252	QC Batch: 9808TX103	Sample ID: 98080192-1	Date Prep: 08/28/1998	Date Anal: 08/28/1998	Analyst: SH
TX as Chloride		mg/kg	0	0	0

# Quality Control Report for LCS Analysis

## INORGANICS

Analyte		LCS Conc		LCS Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Method: EPA 6010A Arsenic, Total	QC Batch: 9808RC111	Sample ID: LCS 20.0 mg/kg	Date Prep: 08/28/1998 0.0	Date Anal: 08/31/1998 20.5	Analyst: GG 103	80	119
Method: EPA 6010A Barium, Total	QC Batch: 9808RC111	Sample ID: LCS 50.0 mg/kg	Date Prep: 08/28/1998 0.0	Date Anal: 08/31/1998 52.5	Analyst: GG 105	80	120
Method: EPA 6010A Cadmium, Total	QC Batch: 9808RC111	Sample ID: LCS 10.0 mg/kg	Date Prep: 08/28/1998 0.0	Date Anal: 08/31/1998 10.3	Analyst: GG 103	78	120
Method: EPA 6010A Chromium, Total	QC Batch: 9808RC111	Sample ID: LCS 10.0 mg/kg	Date Prep: 08/28/1998 0.0	Date Anal: 08/31/1998 10.3	Analyst: GG 103	80	123
Method: EPA 6010A Lead, Total	QC Batch: 9808RC111	Sample ID: LCS 10.0 mg/kg	Date Prep: 08/28/1998 0.0	Date Anal: 08/31/1998 10.4	Analyst: GG 104	77	124
Method: EPA 6010A Selenium, Total	QC Batch: 9808RC111	Sample ID: LCS 10.0 mg/kg	Date Prep: 08/28/1998 0.0	Date Anal: 08/31/1998 9.6	Analyst: GG 96	75	121
Method: EPA 6010A Silver, Total	QC Batch: 9808RC111	Sample ID: LCS 10.0 mg/kg	Date Prep: 08/28/1998 0.0	Date Anal: 08/31/1998 10.0	Analyst: GG 100	74	120
Method: EPA 7471 Mercury, Total	QC Batch: 9808HG094	Sample ID: LCS 0.17 mg/kg	Date Prep: 08/28/1998 0.00	Date Anal: 08/28/1998 0.17	Analyst: SH 100	85	122
Method: EPA 5050/9252 TX as Chloride	QC Batch: 9808TX103	Sample ID: LCS 1000 mg/kg	Date Prep: 08/28/1998 0	Date Anal: 08/28/1998 1000	Analyst: SH 100	70	120

# Quality Control Report for Spike Analysis

## INORGANICS

Analyte		Spike Amount	Sample Result	Spike Result	Percent Recovery	Lower Control Limit	Upper Control Limit
Method: EPA 6010A Arsenic, Total	QC Batch: 9808RC111	Sample ID: 98080207-1 20.0 mg/kg	Date Prep: 08/28/1998 1.3	Date Anal: 08/31/1998 19.6	92	Analyst: GG 70	114
Method: EPA 6010A Barium, Total	QC Batch: 9808RC111	Sample ID: 98080207-1 50.0 mg/kg	Date Prep: 08/28/1998 4.2	Date Anal: 08/31/1998 46.3	84	Analyst: GG 71	123
Method: EPA 6010A Cadmium, Total	QC Batch: 9808RC111	Sample ID: 98080207-1 10.0 mg/kg	Date Prep: 08/28/1998 0.0	Date Anal: 08/31/1998 8.0	80	Analyst: GG 70	113
Method: EPA 6010A Chromium, Total	QC Batch: 9808RC111	Sample ID: 98080207-1 10.0 mg/kg	Date Prep: 08/28/1998 2.4	Date Anal: 08/31/1998 10.9	85	Analyst: GG 69	126
Method: EPA 6010A Lead, Total	QC Batch: 9808RC111	Sample ID: 98080207-1 10.0 mg/kg	Date Prep: 08/28/1998 2.2	Date Anal: 08/31/1998 11.4	92	Analyst: GG 66	123
Method: EPA 6010A Selenium, Total	QC Batch: 9808RC111	Sample ID: 98080207-1 10.0 mg/kg	Date Prep: 08/28/1998 0.0	Date Anal: 08/31/1998 8.0	80	Analyst: GG 59	107
Method: EPA 6010A Silver, Total	QC Batch: 9808RC111	Sample ID: 98080207-1 10.0 mg/kg	Date Prep: 08/28/1998 0.0	Date Anal: 08/31/1998 9.0	90	Analyst: GG 65	114
Method: EPA 7471 Mercury, Total	QC Batch: 9808HG094	Sample ID: 98080202-3 0.17 mg/kg	Date Prep: 08/28/1998 0.00	Date Anal: 08/28/1998 0.16	94	Analyst: SH 78	131
Method: EPA 5050/9252 TX as Chloride	QC Batch: 9808TX103	Sample ID: 98080202-3 1000 mg/kg	Date Prep: 08/28/1998 0	Date Anal: 08/28/1998 920	92	Analyst: SH 74	113

TETCA TECH NOS 220  
Brown & Root Environmental

REPORT TO ADDRESS:

1311 EXECUTIVE CTR. 182

TALL. FL. 32301

TELEPHONE:

850-656-5458

FAX:

850-656-7403

SITE MANAGER:

PAUL CALIGAN

PROJECT NAME:

NAS KEY WEST TRUCK FILL SAND

BRE PROJECT NO.:

7586

CODE:

P.O. NO.:

SHIPPED TO:

PC&amp;B LAB. OVELOS

(LABORATORY NAME, CITY)

PAGE 1 OF 1

## CHAIN OF CUSTODY RECORD

SAMPLED BY (PRINT):

HALVERSON/P. CALIGAN

SAMPLER SIGNATURE:

SAMPLE  
TYPECOMP.  
GRAB

MATRIX

PRES.  
TYPE

PARAMETERS

VOL

TETRAHALIDES

8001

8370

EL: 900

PC&amp;B

PC&amp;B

PC&amp;B

PC&amp;B

PC&amp;B

PC&amp;B

PC&amp;B

PC&amp;B

PC&amp;B

PC&amp;B

PC&amp;B

PC&amp;B

PC&amp;B

PC&amp;B

PC&amp;B

PC&amp;B

PC&amp;B

PC&amp;B

PC&amp;B

PC&amp;B

## LABORATORY ANALYSIS

☒ STANDARD TAT ☐ RUSH☐ 24 HR. ☐ 48 HR. ☐ 72 HR. ☐ 7 DAYS

RESULTS DUE DATE:

COMMENTS:

7 KEPT ON 105 40C

TOTAL NUMBER OF CONTAINERS

3

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

EMPTY BOTTLES RELINQUISHED BY (SIGNATURE)

SEAL INTACT?

YES NO N/A

DATE:

TIME:

EMPTY BOTTLES RECEIVED BY (SIGNATURE)

SEAL INTACT?

YES NO N/A

DATE:

TIME:

RELINQUISHED BY (SIGNATURE)

SEAL INTACT?

YES NO N/A

DATE:

TIME:

RECEIVED BY (SIGNATURE)

SEAL INTACT?

YES NO N/A

DATE:

TIME:

RELINQUISHED BY (SIGNATURE)

SEAL INTACT?

YES NO N/A

DATE:

TIME:

RECEIVED BY (SIGNATURE)

SEAL INTACT?

YES NO N/A

DATE:

TIME:

SPECIAL INSTRUCTIONS:

LABORATORY REMARKS:

SAMPLE CONTAINERS PRECLEANED BY:

☐ BRE ☐ LABORATORY ☐ MANUFACTURER

METHOD OF SHIPMENT:

FED EX

BILL OF LADING NO.:

807041157853

WHITE-FULLY EXECUTED COPY

YELLOW-RECEIVING LABORATORY COPY

PINK-SAMPLERS' COPY/QA COPY

GOLDENROD-SITE MANAGERS' COPY

SAMPLING TEAM:

P. HALVERSON  
P. CALIGAN

RECEIVED FOR LABORATORY

BY (SIGNATURE):

DATE: 8/25/98 TIME: 9:30

No. 3146

## **APPENDIX K**

### **SPECIFIC CAPACITY TEST DATA AND HYDRAULIC CONDUCTIVITY CALCULATIONS**

## HYDRAULIC CONDUCTIVITY GEOMETRIC MEAN

Aquifer parameters of hydraulic conductivity and transmissivity were calculated from the specific capacity test data using a computer program developed by Kasenow and Pare (1995) based on equations presented in Theis (1935), Lohman (1972) and Turcan (1962). Drawdown data from the well, as recorded by the data logger, was entered into the computer program along with required variables that characterize the aquifer (storage and well-loss coefficients), the pumping rate, and well dimensions. Hydraulic conductivity (K) values in the aquifer immediately surrounding the monitoring wells were calculated to be:

$$A902-MW03 = 3.53 \text{ feet/day}$$

$$A902-MW05 = 5.03 \text{ feet/day}$$

$$A902-MW06 = 4.60 \text{ feet/day}$$

The average hydraulic conductivity was determined by calculating the geometric mean of the three values as follows:

$$\begin{aligned} &= e^{\left[ \frac{\ln x_1 + \ln x_2 + \dots + \ln x_n}{n} \right]} \\ &= e^{\left[ \frac{\ln x_1 + \ln x_2 + \ln x_3}{3} \right]} \\ &= e^{\left[ \frac{\ln(3.53 \text{ ft/day}) + \ln(5.03 \text{ ft/day}) + \ln(4.60 \text{ ft/day})}{3} \right]} \\ &= e^{\left[ \frac{4.40 \text{ ft/day}}{3} \right]} \\ &= 4.34 \text{ ft/day} \end{aligned}$$

Q/s

---

Date: 30-Aug-98

Firm: Tetra Tech NUS

Project: Truck Fill Stand, NAS Key West

Source: A902-MW03

Hydrogeologist: P. Calligan

Analysis: Specific Capacity

Well Id: 2-inch

Screen Length: 10-feet

Elevation TOC: 4.25

Comments:

$Q$  = Pumping rate = gpm = 0.50

$r$  = Radius of the pumping well = ft = 0.33

$t$  = Time duration of pumping test = 32.00 min = 0.02222 days

$t(o)$  = Time of zero drawdown = 0.00002030 min = 0.0000000141 days

Slope = ft = 0.13

$T$  = Transmissivity = 1049.00 gpd/ft = 140.57 ft<sup>2</sup>/day = 13.01 m<sup>2</sup>/day

Apparent storage coefficient = 0.000040

Aquifer thickness =  $b$  = ft = 40.00

Hydraulic conductivity =  $K$  = 26.23 gpd/sq Ft = 3.53 ft/day = 1.08 m/day

Field drawdown =  $s$  = ft = 1.64

Corrected drawdown =  $s$  = ft = 0.78

Field specific capacity =  $Q/s$  = gpm/ft = 0.30

Corrected specific capacity =  $Q/s$  = gpm/ft = 0.64

Apparent limit of cone of depression at steady-rate =  $r(o)$  = ft = 418.13



SE1000C  
Environmental Logger  
09/18 08:29

Unit# 00761 Test 1

Setups:	INPUT 1
-----	-----
Type	Level (F)
Mode	TOC
I.D.	00000

Reference	2.260
Linearity	0.000
Scale factor	10.010
Offset	0.050
Delay mSEC	50.000

Step 0 08/30 10:03:33

Elapsed Time	INPUT 1
-----	-----
0.0000	2.266
0.0033	2.266
0.0066	2.266
0.0100	2.266
0.0133	2.263
0.0166	2.263
0.0200	2.819
0.0233	2.253
0.0266	2.332
0.0300	2.440
0.0333	2.468
0.0366	2.471
0.0400	2.513
0.0433	2.544
0.0466	2.595
0.0500	2.636
0.0533	2.535
0.0566	2.617
0.0600	2.699
0.0633	2.680
0.0666	2.674
0.0700	2.683
0.0733	2.702
0.0766	2.699
0.0800	2.696

0.0833	2.696
0.0866	2.696
0.0900	2.699
0.0933	2.696
0.0966	2.699
0.1000	2.702
0.1033	2.699
0.1066	2.702
0.1100	2.705
0.1133	2.705
0.1166	2.705
0.1200	2.712
0.1233	2.712
0.1266	2.715
0.1300	2.718
0.1333	2.718
0.1366	2.724
0.1400	2.721
0.1433	2.728
0.1466	2.724
0.1500	2.728
0.1533	2.731
0.1566	2.734
0.1600	2.734
0.1633	2.734
0.1666	2.737
0.1700	2.740
0.1733	2.740
0.1766	2.740
0.1800	2.743
0.1833	2.747
0.1866	2.750
0.1900	2.750
0.1933	2.750
0.1966	2.753
0.2000	2.753
0.2033	2.756
0.2066	2.753
0.2100	2.759
0.2133	2.759
0.2166	2.759
0.2200	2.762
0.2233	2.765
0.2266	2.769
0.2300	2.769
0.2333	2.772
0.2366	2.775
0.2400	2.772

0.2433	2.772
0.2466	2.778
0.2500	2.778
0.2533	2.778
0.2566	2.781
0.2600	2.784
0.2633	2.784
0.2666	2.784
0.2700	2.788
0.2733	2.788
0.2766	2.791
0.2800	2.791
0.2833	2.791
0.2866	2.794
0.2900	2.794
0.2933	2.794
0.2966	2.797
0.3000	2.800
0.3033	2.800
0.3066	2.803
0.3100	2.803
0.3133	2.803
0.3166	2.807
0.3200	2.807
0.3233	2.810
0.3266	2.810
0.3300	2.807
0.3333	2.810
0.3500	2.813
0.3666	2.822
0.3833	2.829
0.4000	2.835
0.4166	2.851
0.4333	2.883
0.4500	2.892
0.4666	2.895
0.4833	2.905
0.5000	2.911
0.5166	2.917
0.5333	2.920
0.5500	2.927
0.5666	2.936
0.5833	2.939
0.6000	2.946
0.6166	2.955
0.6333	2.958
0.6500	2.965
0.6666	2.968

0.6833	2.974
0.7000	2.984
0.7166	2.987
0.7333	2.996
0.7500	3.003
0.7666	3.003
0.7833	3.009
0.8000	3.015
0.8166	3.015
0.8333	3.022
0.8500	3.025
0.8666	3.031
0.8833	3.034
0.9000	3.037
0.9166	3.044
0.9333	3.044
0.9500	3.053
0.9666	3.050
0.9833	3.056
1.0000	3.056
1.2000	3.117
1.4000	3.164
1.6000	3.202
1.8000	3.237
2.0000	3.268
2.2000	3.303
2.4000	3.325
2.6000	3.347
2.8000	3.373
3.0000	3.395
3.2000	3.423
3.4000	3.452
3.6000	3.455
3.8000	3.461
4.0000	3.471
4.2000	3.487
4.4000	3.496
4.6000	3.499
4.8000	3.515
5.0000	3.534
5.2000	3.540
5.4000	3.547
5.6000	3.562
5.8000	3.572
6.0000	3.588
6.2000	3.588
6.4000	3.607
6.6000	3.607

6.8000	3.619
7.0000	3.626
7.2000	3.635
7.4000	3.645
7.6000	3.642
7.8000	3.645
8.0000	3.642
8.2000	3.654
8.4000	3.651
8.6000	3.664
8.8000	3.667
9.0000	3.667
9.2000	3.686
9.4000	3.686
9.6000	3.689
9.8000	3.692
10.0000	3.702
12.0000	3.746
14.0000	3.790
16.0000	3.841
18.0000	3.815
20.0000	3.838
22.0000	3.866
24.0000	3.888
26.0000	3.882
28.0000	3.885
30.0000	3.895
32.0000	3.879
34.0000	3.891
36.0000	3.910

SE1000C  
Environmental Logger  
09/18 08:33

Unit# 00761 Test 1

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	00000

Reference	2.260
Linearity	0.000
Scale factor	10.010
Offset	0.050
Delay mSEC	50.000

Step 1 08/30 10:40:18

Elapsed Time	INPUT 1
0.0000	3.901
0.0033	3.898
0.0066	3.901
0.0100	3.790
0.0133	3.926
0.0166	3.866
0.0200	3.841
0.0233	3.806
0.0266	3.815
0.0300	3.796
0.0333	3.796
0.0366	3.790
0.0400	3.765
0.0433	3.768
0.0466	3.768
0.0500	3.759
0.0533	3.755
0.0566	3.749
0.0600	3.743
0.0633	3.736
0.0666	3.733
0.0700	3.727
0.0733	3.721
0.0766	3.717
0.0800	3.708

0.0833	3.698
0.0866	3.695
0.0900	3.689
0.0933	3.679
0.0966	3.679
0.1000	3.670
0.1033	3.664
0.1066	3.657
0.1100	3.651
0.1133	3.645
0.1166	3.638
0.1200	3.635
0.1233	3.626
0.1266	3.623
0.1300	3.616
0.1333	3.610
0.1366	3.604
0.1400	3.597
0.1433	3.594
0.1466	3.588
0.1500	3.585
0.1533	3.575
0.1566	3.572
0.1600	3.566
0.1633	3.562
0.1666	3.559
0.1700	3.553
0.1733	3.550
0.1766	3.547
0.1800	3.540
0.1833	3.540
0.1866	3.531
0.1900	3.528
0.1933	3.528
0.1966	3.521
0.2000	3.515
0.2033	3.515
0.2066	3.512
0.2100	3.509
0.2133	3.502
0.2166	3.499
0.2200	3.496
0.2233	3.493
0.2266	3.493
0.2300	3.490
0.2333	3.480
0.2366	3.480
0.2400	3.477

0.2433	3.471
0.2466	3.468
0.2500	3.468
0.2533	3.461
0.2566	3.461
0.2600	3.461
0.2633	3.458
0.2666	3.455
0.2700	3.455
0.2733	3.449
0.2766	3.445
0.2800	3.442
0.2833	3.439
0.2866	3.442
0.2900	3.436
0.2933	3.433
0.2966	3.426
0.3000	3.430
0.3033	3.426
0.3066	3.423
0.3100	3.420
0.3133	3.417
0.3166	3.414
0.3200	3.414
0.3233	3.411
0.3266	3.411
0.3300	3.404
0.3333	3.404
0.3500	3.395
0.3666	3.382
0.3833	3.373
0.4000	3.357
0.4166	3.351
0.4333	3.338
0.4500	3.332
0.4666	3.322
0.4833	3.313
0.5000	3.306
0.5166	3.297
0.5333	3.290
0.5500	3.287
0.5666	3.281
0.5833	3.275
0.6000	3.265
0.6166	3.259
0.6333	3.253
0.6500	3.246
0.6666	3.240



0.6833	3.237
0.7000	3.227
0.7166	3.224
0.7333	3.218
0.7500	3.211
0.7666	3.205
0.7833	3.199
0.8000	3.192
0.8166	3.189
0.8333	3.183
0.8500	3.177
0.8666	3.170
0.8833	3.167
0.9000	3.161
0.9166	3.154
0.9333	3.148
0.9500	3.145
0.9666	3.139
0.9833	3.129
1.0000	3.126
1.2000	3.075
1.4000	3.015
1.6000	2.927
1.8000	2.870
2.0000	2.835
2.2000	2.803
2.4000	2.772
2.6000	2.743
2.8000	2.709
3.0000	2.686
3.2000	2.661
3.4000	2.642
3.6000	2.620
3.8000	2.598
4.0000	2.582
4.2000	2.563
4.4000	2.547
4.6000	2.531
4.8000	2.516
5.0000	2.500
5.2000	2.490
5.4000	2.481
5.6000	2.468
5.8000	2.456
6.0000	2.446
6.2000	2.440
6.4000	2.430
6.6000	2.421

6.8000	2.418
7.0000	2.408
7.2000	2.405
7.4000	2.395
7.6000	2.389
7.8000	2.386
8.0000	2.380
8.2000	2.377
8.4000	2.370
8.6000	2.370
8.8000	2.364
9.0000	2.358
9.2000	2.358
9.4000	2.354
9.6000	2.354
9.8000	2.348
10.0000	2.345
12.0000	2.323
14.0000	2.313
16.0000	2.304
18.0000	2.297
20.0000	2.297
22.0000	2.291
24.0000	2.291
26.0000	2.288
28.0000	2.291
30.0000	2.282
32.0000	2.285

Q/s

---

Date: 30-Aug-98

Firm: Tetra Tech NUS

Project: Truck Fill Stand, NAS Key West

Source: A902-MW05

Hydrogeologist: P. Calligan

Analysis: Specific Capacity

Well Id: 2-inch

Screen Length: 10-feet

Elevation TOC: 4.46

Comments:

$Q$  = Pumping rate = gpm = 0.51

$r$  = Radius of the pumping well = ft = 0.33

$t$  = Time duration of pumping test = 35.00 min = 0.02431 days

$t(o)$  = Time of zero drawdown = 0.00001420 min = 0.0000000099 days

Slope = ft = 0.09

$T$  = Transmissivity = 1499.00 gpd/ft = 200.87 ft<sup>2</sup>/day = 18.59 m<sup>2</sup>/day

Apparent storage coefficient = 0.000040

Aquifer thickness =  $b$  = ft = 40.00

Hydraulic conductivity =  $K$  = 37.47 gpd/sq Ft = 5.03 ft/day = 1.52 m/day

Field drawdown =  $s$  = ft = 1.21

Corrected drawdown =  $s$  = ft = 0.58

Field specific capacity =  $Q/s$  = gpm/ft = 0.42

Corrected specific capacity =  $Q/s$  = gpm/ft = 0.89

Apparent limit of cone of depression at steady-rate =  $r(o)$  = ft = 522.74

SE1000C  
Environmental Logger  
09/18 08:39

Unit# 00761 Test 2

Setups:	INPUT 1
-----	-----
Type	Level (F)
Mode	TOC
I.D.	00000

Reference	2.620
Linearity	0.000
Scale factor	10.010
Offset	0.050
Delay mSEC	50.000

Step 0 08/30 11:59:16

Elapsed Time	INPUT 1
-----	-----
0.0000	2.620
0.0033	2.616
0.0066	2.620
0.0100	2.620
0.0133	2.803
0.0166	2.977
0.0200	2.537
0.0233	2.724
0.0266	2.831
0.0300	2.752
0.0333	2.891
0.0366	2.863
0.0400	2.914
0.0433	2.952
0.0466	2.986
0.0500	2.718
0.0533	2.967
0.0566	3.053
0.0600	2.945
0.0633	3.018
0.0666	2.958
0.0700	3.043
0.0733	2.974
0.0766	3.024
0.0800	2.996

0.0833	2.999
0.0866	2.999
0.0900	2.999
0.0933	3.005
0.0966	2.996
0.1000	2.999
0.1033	3.002
0.1066	2.996
0.1100	2.996
0.1133	2.996
0.1166	3.002
0.1200	2.996
0.1233	2.996
0.1266	3.002
0.1300	2.999
0.1333	2.999
0.1366	2.999
0.1400	3.002
0.1433	2.999
0.1466	2.999
0.1500	3.002
0.1533	3.005
0.1566	3.005
0.1600	2.999
0.1633	3.005
0.1666	3.002
0.1700	3.009
0.1733	3.002
0.1766	3.002
0.1800	3.005
0.1833	3.002
0.1866	3.012
0.1900	3.005
0.1933	3.009
0.1966	3.002
0.2000	3.012
0.2033	3.015
0.2066	3.002
0.2100	3.012
0.2133	3.009
0.2166	3.009
0.2200	3.009
0.2233	3.012
0.2266	3.012
0.2300	3.015
0.2333	3.009
0.2366	3.015
0.2400	3.018

0.2433	3.015
0.2466	3.021
0.2500	3.024
0.2533	3.018
0.2566	3.018
0.2600	3.018
0.2633	3.027
0.2666	3.021
0.2700	3.021
0.2733	3.027
0.2766	3.018
0.2800	3.024
0.2833	3.021
0.2866	3.034
0.2900	3.031
0.2933	3.031
0.2966	3.027
0.3000	3.027
0.3033	3.031
0.3066	3.031
0.3100	3.034
0.3133	3.034
0.3166	3.034
0.3200	3.034
0.3233	3.034
0.3266	3.031
0.3300	3.037
0.3333	3.037
0.3500	3.046
0.3666	3.053
0.3833	3.050
0.4000	3.062
0.4166	3.065
0.4333	3.069
0.4500	3.075
0.4666	3.075
0.4833	3.088
0.5000	3.081
0.5166	3.084
0.5333	3.088
0.5500	3.097
0.5666	3.103
0.5833	3.103
0.6000	3.107
0.6166	3.116
0.6333	3.116
0.6500	3.116
0.6666	3.129

0.6833	3.129
0.7000	3.135
0.7166	3.138
0.7333	3.148
0.7500	3.148
0.7666	3.144
0.7833	3.160
0.8000	3.154
0.8166	3.163
0.8333	3.160
0.8500	3.167
0.8666	3.173
0.8833	3.176
0.9000	3.179
0.9166	3.186
0.9333	3.186
0.9500	3.198
0.9666	3.195
0.9833	3.195
1.0000	3.201
1.2000	3.252
1.4000	3.284
1.6000	3.309
1.8000	3.341
2.0000	3.375
2.2000	3.407
2.4000	3.432
2.6000	3.454
2.8000	3.467
3.0000	3.492
3.2000	3.496
3.4000	3.527
3.6000	3.537
3.8000	3.546
4.0000	3.562
4.2000	3.578
4.4000	3.581
4.6000	3.597
4.8000	3.606
5.0000	3.613
5.2000	3.619
5.4000	3.635
5.6000	3.638
5.8000	3.641
6.0000	3.647
6.2000	3.654
6.4000	3.660
6.6000	3.660



6.8000	3.669
7.0000	3.669
7.2000	3.676
7.4000	3.682
7.6000	3.688
7.8000	3.688
8.0000	3.695
8.2000	3.698
8.4000	3.695
8.6000	3.698
8.8000	3.714
9.0000	3.717
9.2000	3.714
9.4000	3.717
9.6000	3.730
9.8000	3.717
10.0000	3.726
12.0000	3.752
14.0000	3.758
16.0000	3.771
18.0000	3.780
20.0000	3.796
22.0000	3.805
24.0000	3.821
26.0000	3.824
28.0000	3.821
30.0000	3.834
32.0000	3.840
34.0000	3.831

SE1000C  
Environmental Logger  
09/18 08:45

Unit# 00761 Test 2

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	00000

Reference	2.620
Linearity	0.000
Scale factor	10.010
Offset	0.050
Delay mSEC	50.000

Step 1 08/30 12:34:06

Elapsed Time	INPUT 1
0.0000	3.837
0.0033	3.831
0.0066	3.609
0.0100	3.979
0.0133	3.714
0.0166	3.824
0.0200	3.733
0.0233	3.726
0.0266	3.752
0.0300	3.704
0.0333	3.695
0.0366	3.701
0.0400	3.679
0.0433	3.669
0.0466	3.666
0.0500	3.657
0.0533	3.669
0.0566	3.628
0.0600	3.638
0.0633	3.641
0.0666	3.619
0.0700	3.632
0.0733	3.609
0.0766	3.622
0.0800	3.606

0.0833	3.609
0.0866	3.603
0.0900	3.597
0.0933	3.590
0.0966	3.590
0.1000	3.590
0.1033	3.584
0.1066	3.578
0.1100	3.575
0.1133	3.571
0.1166	3.575
0.1200	3.565
0.1233	3.565
0.1266	3.565
0.1300	3.549
0.1333	3.568
0.1366	3.527
0.1400	3.575
0.1433	3.527
0.1466	3.552
0.1500	3.533
0.1533	3.537
0.1566	3.549
0.1600	3.533
0.1633	3.533
0.1666	3.533
0.1700	3.530
0.1733	3.530
0.1766	3.518
0.1800	3.530
0.1833	3.524
0.1866	3.514
0.1900	3.514
0.1933	3.524
0.1966	3.502
0.2000	3.514
0.2033	3.511
0.2066	3.508
0.2100	3.511
0.2133	3.508
0.2166	3.492
0.2200	3.492
0.2233	3.524
0.2266	3.480
0.2300	3.505
0.2333	3.492
0.2366	3.486
0.2400	3.492

0.2433	3.496
0.2466	3.480
0.2500	3.492
0.2533	3.477
0.2566	3.492
0.2600	3.470
0.2633	3.480
0.2666	3.477
0.2700	3.480
0.2733	3.477
0.2766	3.470
0.2800	3.480
0.2833	3.467
0.2866	3.470
0.2900	3.464
0.2933	3.464
0.2966	3.473
0.3000	3.454
0.3033	3.470
0.3066	3.458
0.3100	3.458
0.3133	3.461
0.3166	3.458
0.3200	3.454
0.3233	3.454
0.3266	3.458
0.3300	3.451
0.3333	3.451
0.3500	3.442
0.3666	3.435
0.3833	3.426
0.4000	3.420
0.4166	3.413
0.4333	3.407
0.4500	3.397
0.4666	3.391
0.4833	3.385
0.5000	3.375
0.5166	3.369
0.5333	3.363
0.5500	3.356
0.5666	3.350
0.5833	3.344
0.6000	3.337
0.6166	3.334
0.6333	3.325
0.6500	3.318
0.6666	3.315

0.6833	3.309
0.7000	3.303
0.7166	3.296
0.7333	3.293
0.7500	3.287
0.7666	3.280
0.7833	3.277
0.8000	3.274
0.8166	3.268
0.8333	3.265
0.8500	3.258
0.8666	3.252
0.8833	3.246
0.9000	3.243
0.9166	3.236
0.9333	3.236
0.9500	3.230
0.9666	3.227
0.9833	3.220
1.0000	3.214
1.2000	3.151
1.4000	3.107
1.6000	3.135
1.8000	3.053
2.0000	3.015
2.2000	2.986
2.4000	2.961
2.6000	2.942
2.8000	2.917
3.0000	2.904
3.2000	2.885
3.4000	2.873
3.6000	2.854
3.8000	2.841
4.0000	2.831
4.2000	2.819
4.4000	2.800
4.6000	2.803
4.8000	2.790
5.0000	2.784
5.2000	2.774
5.4000	2.768
5.6000	2.759
5.8000	2.752
6.0000	2.746
6.2000	2.743
6.4000	2.740
6.6000	2.727

6.8000	2.727
7.0000	2.721
7.2000	2.714
7.4000	2.714
7.6000	2.708
7.8000	2.708
8.0000	2.705
8.2000	2.702
8.4000	2.699
8.6000	2.692
8.8000	2.689
9.0000	2.689
9.2000	2.686
9.4000	2.683
9.6000	2.683
9.8000	2.683
10.0000	2.676
12.0000	2.657
14.0000	2.648
16.0000	2.638
18.0000	2.629
20.0000	2.626
22.0000	2.616
24.0000	2.616
26.0000	2.613
28.0000	2.607

Q/s

---

Date: 30-Aug-98

Firm: Tetra Tech NUS

Project: Truck Fill Stand, NAS Key West

Source: A902-MW06

Hydrogeologist: P. Calligan

Analysis: Specific Capacity

Well Id: 2-inch

Screen Length: 10-feet

Elevation TOC: 4.00

Comments:

$Q$  = Pumping rate = gpm = 0.48

$r$  = Radius of the pumping well = ft = 0.33

$t$  = Time duration of pumping test = 51.75 min = 0.03594 days

$t(o)$  = Time of zero drawdown = 0.00001552 min = 0.0000000108 days

Slope = ft = 0.09

$T$  = Transmissivity = 1372.00 gpd/ft = 183.85 ft<sup>2</sup>/day = 17.01 m<sup>2</sup>/day

Apparent storage coefficient = 0.000040

Aquifer thickness =  $b$  = ft = 40.00

Hydraulic conductivity =  $K$  = 34.30 gpd/sq Ft = 4.60 ft/day = 1.40 m/day

Field drawdown =  $s$  = ft = 1.27

Corrected drawdown =  $s$  = ft = 0.60

Field specific capacity =  $Q/s$  = gpm/ft = 0.38

Corrected specific capacity =  $Q/s$  = gpm/ft = 0.79

Apparent limit of cone of depression at steady-rate =  $r(o)$  = ft = 608.11



SE1000C  
Environmental Logger  
09/18 08:19

Unit# 00761 Test 0

Setups:	INPUT 1
-----	-----
Type	Level (F)
Mode	TOC
I.D.	00000

Reference	2.240
Linearity	0.000
Scale factor	10.010
Offset	0.050
Delay mSEC	50.000

Step 0 08/30 06:55:59

Elapsed Time	INPUT 1
-----	-----
0.0000	2.240
0.0033	2.243
0.0066	2.243
0.0100	2.243
0.0133	2.243
0.0166	2.243
0.0200	2.243
0.0233	2.240
0.0266	2.240
0.0300	2.243
0.0333	2.243
0.0366	2.243
0.0400	2.243
0.0433	2.243
0.0466	2.240
0.0500	2.246
0.0533	2.315
0.0566	2.461
0.0600	2.141
0.0633	2.369
0.0666	2.375
0.0700	2.309
0.0733	2.407
0.0766	2.394
0.0800	2.417

0.0833	2.436
0.0866	2.217
0.0900	2.492
0.0933	2.537
0.0966	2.474
0.1000	2.537
0.1033	2.505
0.1066	2.527
0.1100	2.530
0.1133	2.524
0.1166	2.530
0.1200	2.524
0.1233	2.534
0.1266	2.530
0.1300	2.530
0.1333	2.534
0.1366	2.537
0.1400	2.543
0.1433	2.546
0.1466	2.546
0.1500	2.546
0.1533	2.553
0.1566	2.549
0.1600	2.553
0.1633	2.559
0.1666	2.559
0.1700	2.565
0.1733	2.565
0.1766	2.572
0.1800	2.572
0.1833	2.575
0.1866	2.575
0.1900	2.581
0.1933	2.584
0.1966	2.584
0.2000	2.591
0.2033	2.591
0.2066	2.594
0.2100	2.597
0.2133	2.597
0.2166	2.600
0.2200	2.600
0.2233	2.606
0.2266	2.606
0.2300	2.613
0.2333	2.613
0.2366	2.619
0.2400	2.616

0.2433	2.622
0.2466	2.622
0.2500	2.625
0.2533	2.628
0.2566	2.632
0.2600	2.632
0.2633	2.638
0.2666	2.641
0.2700	2.641
0.2733	2.644
0.2766	2.647
0.2800	2.654
0.2833	2.654
0.2866	2.657
0.2900	2.660
0.2933	2.660
0.2966	2.660
0.3000	2.666
0.3033	2.663
0.3066	2.670
0.3100	2.673
0.3133	2.673
0.3166	2.676
0.3200	2.679
0.3233	2.682
0.3266	2.682
0.3300	2.685
0.3333	2.689
0.3500	2.698
0.3666	2.708
0.3833	2.717
0.4000	2.727
0.4166	2.736
0.4333	2.745
0.4500	2.752
0.4666	2.758
0.4833	2.764
0.5000	2.774
0.5166	2.780
0.5333	2.787
0.5500	2.790
0.5666	2.799
0.5833	2.806
0.6000	2.809
0.6166	2.815
0.6333	2.818
0.6500	2.828
0.6666	2.834

0.6833	2.837
0.7000	2.844
0.7166	2.847
0.7333	2.853
0.7500	2.853
0.7666	2.859
0.7833	2.866
0.8000	2.872
0.8166	2.872
0.8333	2.881
0.8500	2.881
0.8666	2.888
0.8833	2.888
0.9000	2.894
0.9166	2.897
0.9333	2.900
0.9500	2.907
0.9666	2.913
0.9833	2.907
1.0000	2.897
1.2000	2.986
1.4000	3.008
1.6000	3.033
1.8000	3.055
2.0000	3.078
2.2000	3.093
2.4000	3.109
2.6000	3.116
2.8000	3.128
3.0000	3.138
3.2000	3.147
3.4000	3.150
3.6000	3.157
3.8000	3.163
4.0000	3.169
4.2000	3.179
4.4000	3.185
4.6000	3.188
4.8000	3.198
5.0000	3.201
5.2000	3.207
5.4000	3.214
5.6000	3.217
5.8000	3.217
6.0000	3.223
6.2000	3.233
6.4000	3.233
6.6000	3.233

6.8000	3.239
7.0000	3.242
7.2000	3.242
7.4000	3.245
7.6000	3.245
7.8000	3.252
8.0000	3.261
8.2000	3.267
8.4000	3.274
8.6000	3.277
8.8000	3.286
9.0000	3.289
9.2000	3.293
9.4000	3.296
9.6000	3.302
9.8000	3.302
10.0000	3.308
12.0000	3.327
14.0000	3.334
16.0000	3.343
18.0000	3.375
20.0000	3.365
22.0000	3.381
24.0000	3.391
26.0000	3.400
28.0000	3.397
30.0000	3.403
32.0000	3.410
34.0000	3.410
36.0000	3.419
38.0000	3.413
40.0000	3.441
42.0000	3.441
44.0000	3.444
46.0000	3.441
48.0000	3.448
50.0000	3.448
52.0000	3.454

SE1000C  
Environmental Logger  
09/18 08:23

Unit# 00761 Test 0

Setups:	INPUT 1
-----	-----
Type	Level (F)
Mode	TOC
I.D.	00000

Reference	2.240
Linearity	0.000
Scale factor	10.010
Offset	0.050
Delay mSEC	50.000

Step 1 08/30 07:48:50

Elapsed Time	INPUT 1
-----	-----
0.0000	3.454
0.0033	3.451
0.0066	3.451
0.0100	3.454
0.0133	3.448
0.0166	3.451
0.0200	3.451
0.0233	3.359
0.0266	3.482
0.0300	3.381
0.0333	3.419
0.0366	3.381
0.0400	3.381
0.0433	3.375
0.0466	3.372
0.0500	3.365
0.0533	3.359
0.0566	3.356
0.0600	3.353
0.0633	3.350
0.0666	3.346
0.0700	3.337
0.0733	3.337
0.0766	3.331
0.0800	3.324

0.0833	3.318
0.0866	3.312
0.0900	3.308
0.0933	3.305
0.0966	3.299
0.1000	3.293
0.1033	3.289
0.1066	3.289
0.1100	3.280
0.1133	3.274
0.1166	3.274
0.1200	3.264
0.1233	3.261
0.1266	3.255
0.1300	3.252
0.1333	3.242
0.1366	3.239
0.1400	3.233
0.1433	3.229
0.1466	3.220
0.1500	3.217
0.1533	3.214
0.1566	3.207
0.1600	3.207
0.1633	3.201
0.1666	3.198
0.1700	3.195
0.1733	3.188
0.1766	3.185
0.1800	3.179
0.1833	3.176
0.1866	3.172
0.1900	3.169
0.1933	3.166
0.1966	3.160
0.2000	3.157
0.2033	3.153
0.2066	3.153
0.2100	3.150
0.2133	3.144
0.2166	3.144
0.2200	3.138
0.2233	3.131
0.2266	3.119
0.2300	3.109
0.2333	3.106
0.2366	3.097
0.2400	3.090

0.2433	3.078
0.2466	3.071
0.2500	3.062
0.2533	3.052
0.2566	3.024
0.2600	3.011
0.2633	3.002
0.2666	2.998
0.2700	2.989
0.2733	2.983
0.2766	2.973
0.2800	2.961
0.2833	2.957
0.2866	2.951
0.2900	2.948
0.2933	2.942
0.2966	2.938
0.3000	2.932
0.3033	2.926
0.3066	2.926
0.3100	2.923
0.3133	2.923
0.3166	2.923
0.3200	2.919
0.3233	2.916
0.3266	2.913
0.3300	2.913
0.3333	2.907
0.3500	2.866
0.3666	2.847
0.3833	2.840
0.4000	2.837
0.4166	2.834
0.4333	2.831
0.4500	2.825
0.4666	2.825
0.4833	2.818
0.5000	2.818
0.5166	2.818
0.5333	2.815
0.5500	2.812
0.5666	2.809
0.5833	2.806
0.6000	2.799
0.6166	2.796
0.6333	2.793
0.6500	2.790
0.6666	2.787



0.6833	2.783
0.7000	2.777
0.7166	2.774
0.7333	2.768
0.7500	2.768
0.7666	2.764
0.7833	2.758
0.8000	2.752
0.8166	2.745
0.8333	2.745
0.8500	2.739
0.8666	2.736
0.8833	2.736
0.9000	2.730
0.9166	2.727
0.9333	2.720
0.9500	2.720
0.9666	2.714
0.9833	2.711
1.0000	2.708
1.2000	2.657
1.4000	2.622
1.6000	2.594
1.8000	2.565
2.0000	2.584
2.2000	2.543
2.4000	2.511
2.6000	2.489
2.8000	2.486
3.0000	2.474
3.2000	2.461
3.4000	2.448
3.6000	2.439
3.8000	2.436
4.0000	2.429
4.2000	2.420
4.4000	2.417
4.6000	2.410
4.8000	2.404
5.0000	2.398
5.2000	2.398
5.4000	2.391
5.6000	2.385
5.8000	2.385
6.0000	2.382
6.2000	2.375
6.4000	2.372
6.6000	2.372

6.8000	2.369
7.0000	2.366
7.2000	2.360
7.4000	2.360
7.6000	2.356
7.8000	2.356
8.0000	2.350
8.2000	2.350
8.4000	2.347
8.6000	2.347
8.8000	2.344
9.0000	2.341
9.2000	2.341
9.4000	2.338
9.6000	2.338
9.8000	2.338
10.0000	2.334
12.0000	2.325
14.0000	2.309
16.0000	2.300
18.0000	2.296
20.0000	2.290
22.0000	2.287
24.0000	2.287
26.0000	2.281
28.0000	2.281
30.0000	2.281
32.0000	2.277
34.0000	2.281
36.0000	2.277

## **APPENDIX L**

### **GROUNDWATER GRADIENT AND FLOW CALCULATIONS**

## GROUNDWATER FLOW GRADIENT

The groundwater flow gradient was determined using the following equation:

$$i = \frac{h_1 - h_2}{d}$$

where:

$i$  = the hydraulic gradient

$h_1$  = the water elevation at point 1

$h_2$  = the water elevation at point 2

$d$  = the distance between point 1 and point 2

The distance and groundwater elevations were obtained from Figure 3-2.

The gradient across the site was calculated after constructing groundwater contours from the October 2, 1998, depth to water data, determining the perpendicular distance between two of these contours, and utilizing the following calculation:

$$i = \frac{2.10 \text{ ft} - 2.00 \text{ ft}}{85 \text{ ft}}$$

$$i = \frac{0.10 \text{ ft}}{85 \text{ ft}}$$

$$i = 0.001 \text{ ft/ft}$$

## GROUNDWATER FLOW VELOCITY

Potential movement of groundwater at the site may be described in terms of transportation by natural flow system in the saturated zone, assuming groundwater flow follows Darcy's Law. Darcy's Law may be expressed as:

$$V = \left( \frac{K}{n} \right) \times i$$

where:

V = average velocity

K = hydraulic conductivity = 4.34 ft/day

n = effective porosity (assumed) = 0.30

i = average hydraulic gradient = 0.001 ft/ft

therefore:

$$V = \left( \frac{4.34 \text{ ft/day}}{0.30} \right) \times 0.001 \text{ ft/ft}$$

$$V = 0.02 \text{ ft/day}$$

**APPENDIX M**  
**TIDAL SURVEY DATA**

SE1000C  
Environmental Logger  
09/18 08:49

Unit# 00761 Test 3

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	00000

Reference	2.230
Linearity	0.000
Scale factor	10.010
Offset	0.050
Delay mSEC	50.000

Step 0 08/31 05:43:05

Elapsed Time	INPUT 1
0.0000	2.233
30.0000	2.252
60.0000	2.267
90.0000	2.280
120.000	2.302
150.000	2.321
180.000	2.334
210.000	2.350
240.000	2.356
270.000	2.372
300.000	2.375
330.000	2.372
360.000	2.369
390.000	2.369
420.000	2.366
450.000	2.356
480.000	2.366
510.000	2.359
540.000	2.356
570.000	2.353
600.000	2.353
630.000	2.359
660.000	2.362
690.000	2.362
720.000	2.362

750.000	2.369
780.000	2.372
810.000	2.378
840.000	2.381
870.000	2.372
900.000	2.375
930.000	2.372
960.000	2.366
990.000	2.362
1020.00	2.356
1050.00	2.347
1080.00	2.334
1110.00	2.324
1140.00	2.312
1170.00	2.296
1200.00	2.290
1230.00	2.277
1260.00	2.264
1290.00	2.258
1320.00	2.252
1350.00	2.245
1380.00	2.255
1410.00	2.258
1440.00	2.261
1470.00	2.280